

Latest Products from...

Thermal Switches



See page 517

Humidity & Temperature Sensors



See page 520

Gear Tooth Sensor



See page 559

Slot Sensors



See page 573

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Thermocouples and Probes

Thermocouple Colour Code

THERMOCOUPLE CABLE COLOUR CODING									
Thermocouple Cable Colour Combination Type	Extension Cable	Compensating Cable	INTERNATIONAL COLOUR CODE TO IEC 60584-3 (2008) PART 3 (2008)	INTERNATIONAL COLOUR CODE TO IEC 60584-3 (2008) PART 3 (2008) For unimultaneously used conductors	FORMER IEC COLOUR CODING FOR THERMOCOUPLE EXTENSION & COMPENSATING CABLE	BRITISH TO BS 1985	JAPANESE TO JIS C 1601 1976-1981	AMERICAN TO ANSI/ISA-95.1	FRENCH TO NF C 49-24
K	KX								
	KCA								
	KCB								
T	TX								
J	JX								
N	NX								
E	EX								
R	RCA								
	RCB								
S	SCA								
	SCB								

Thermocouple Type Letter Designations

The following letter designations are established for thermocouple wire combinations as follows:

Letter	Thermocouple	Temp Range °C
T	Copper/copper-nickel	-150 to +350
J	Iron/copper-nickel	0 to +700
K	Nickel-chromium/nickel-aluminium	0 to +1200
N	Nickel-chromium-silicon/nickel-silicon	0 to +1250
S	Platinum 10% rhodium/platinum	0 to +1500
R	Platinum 13% rhodium/platinum	0 to +1600

Types	Tolerance Class 1	Tolerance Class 2
Type T		
Temperature range	-40°C to +125°C	-40°C to +133°C
Tolerance value	±0.5°C	±1°C
Temperature range	125°C to 350°C	133°C to 350°C
Tolerance value	±0.4%	±0.75%
Type J		
Temperature range	-40°C to +375°C	-40°C to +333°C
Tolerance value	±1.5°C	±2.5°C
Temperature range	375°C to 750°C	333°C to 750°C
Tolerance value	±0.4%	±0.75%
Type K, Type N		
Temperature range	-40°C to +375°C	-40°C to +333°C
Tolerance value	±1.5°C	±2.5°C
Temperature range	375°C to 1200°C	333°C to 1200°C
Tolerance value	±0.4%	±0.75%
Type R, Type S		
Temperature range	0°C to 1100°C	0°C to +600°C
Tolerance value	±1°C	±1.5°C
Temperature range	1100°C to 1600°C	600°C to 1600°C
Tolerance value	±(1 + 0.3% of T - 1100)°C	±0.25%

Thermocouple application guide

Immersion depth

The required depth of probe immersion at which no incorrect reading will occur due to insufficient immersion.

Response times

The time in which the probe will attain a proportion of the final medium temperature. Normally quoted as the time taken to achieve a percentage of a step temperature change. The probe construction, i.e. isolated or grounded junction, application and environment will affect response times.

Type T

Copper/Copper-Nickel — 150 to 350°C

Widely used to measure low temperatures, and in applications where moisture is present. May be used in oxidising, or reducing atmospheres.

Type J

Iron/Copper-Nickel — 0 to 700°C

May be used in oxidising atmospheres, limited to below 500°C in sulphurous atmospheres. Iron conductor liable to rust at low temperatures (ice point and below).

Type K

Nickel-Chromium/Nickel-Aluminium — 0 to 1200°C

Widely used thermocouple with a useful measuring range. Not recommended for sulphur bearing atmospheres or reducing atmospheres, but good resistance to oxidising atmosphere.

Type N

Nickel-Chromium-Silicon/Nickel-Silicon — 0 to 1250°C

Very good resistance to oxidising atmospheres, and may be used when good stability at high temperatures is required.

Type R/S

Platinum — 10% Rhodium/Platinum 0 to 1500°C

Platinum — 13% Rhodium/Platinum 0 to 1600°C

Recommended for very high temperature use in oxidising atmospheres. For some applications a secondary ceramic protective sheath is recommended.

The application guide above gives recommendations appertaining to the primary thermocouple wire. When protected by the appropriate outer sheath, some of the limitations given can be overcome.

212223

Thermocouple - Fine Wire, Welded Tip

Type K or T



- High sensitivity, exposed junction
- Thermocouples to IEC 60584
- 1/0.08mm single wires, 1m length
- PFA insulated wires, class 1
- Rated from -75 to +250°C

386285

Order Multiple= Pack of 5		Price Per Pack			
Description	Mfrs. List No.	Order Code	1+	5+	10+
Type K tails	ZO-PFA-K-1 X 5	859-8240●	25.18	22.75	20.87
Type T tails	ZO-PFA-T-1 X 5	859-8258●	25.18	22.75	20.87

Welded Tip Thermocouples - Types J, K & T

Fibre Glass Insulated and PTFE Insulated



Fibre glass insulated

PTFE insulated

- 1 metre and 2 metre long welded tip thermocouples
- Choice of insulation: varnish-impregnated fibre glass (suitable for temperatures up to 350°C) or PTFE (suitable up to 250°C) which is chemically inert
- Manufactured to international reference tables BS4937 (Part 3 for type J, Part 4 for Type K, Part 5 for Type T)

Fibre Glass Insulated	Type J	Type K	Type T
Wire diameter	1/0.315mm	1/0.315mm	1/0.315mm
Overall diameter	1.5mm	1.5mm	1.5mm
Temperature range	-50°C to +350°C	-50°C to +350°C	-50°C to +350°C
Positive leg	Iron	Nickel chromium	Iron
Negative leg	Constantan	Nickel aluminium	Constantan
PTFE Insulated	Type K	Type T	
Wire diameter	—	1/0.2mm	1/0.2mm
Overall diameter	—	1.3mm	1.3mm
Temperature range	—	-50°C to +250°C	-50°C to +250°C
Positive leg	—	Nickel chromium	Copper
Negative leg	—	Nickel aluminium	Constantan

212224

Fibre Glass Insulated	Mfrs. List No.	Order Code	1+	10+	25+	100+
Type J, 2m	Z3-J-2M (IEC)	706-9212●	5.82	5.38	5.12	4.74
Type J, 3m	Z3-J-3M (IEC)	NEW 163-3477●	5.93	5.63	5.34	5.05
Type K, 1m	Z3-K-1M (IEC)	706-9224●	4.31	4.02	3.68	3.33
Type K, 2m	Z3-K-2M (IEC)	707-6137●	6.28	5.81	5.52	5.04
Type K, 3m	Z3-K-3M (IEC)	NEW 163-3479●	6.49	6.17	5.84	5.52
Type T, 2m	Z3-T-2M (IEC)	707-6149●	5.24	4.85	4.75	4.30
PTFE Insulated						
Type K, 1m	Z2-K-1M (IEC)	707-6150●	3.39	3.15	2.91	2.61
Type K, 2m	Z2-K-2M (IEC)	707-6162●	5.80	5.56	4.99	4.49
Type K, 3m	Z2-K-3M (IEC)	NEW 163-3481●	6.18	5.87	5.56	5.25

Fibre Glass Insulated	Mfrs. List No.	Order Code	1+	10+	25+	100+
PTFE Insulated						
Type K, 5m	Z2-K-5M (IEC) NEW	163-3482 ●	7.83	7.44	7.05	6.65
Type T, 1m	Z2-T-1M (IEC)	707-6174 ●	3.06	2.86	2.61	2.36
Type T, 2m	Z2-T-2M (IEC)	707-6186 ●	4.59	4.28	3.94	3.56
Type T, 3m	Z2-T-3M (IEC) NEW	163-3483 ●	5.46	5.19	4.91	4.65
Type T, 5m	Z2-T-5M (IEC) NEW	163-3484 ●	6.80	6.46	6.12	5.78

Probes Types J, K and T



Overall length = 207 (4.5mm dia type), 163 (3mm dia types), Probe length = 125, Probe diameter = 3.0 or 4.5 (type K), 3.0 (types J and T), Bush thread = 1/4"BSPT, Lead length = 1m

- Thermocouple mineral-insulated probes sheathed in stainless steel, intended for temperature measurement and control applications
- Probes have an adjustable brass coupling which may be secured at any position along the length of the body to give the required depth of insertion
- Coupling includes a sealing olive which provides a gas or liquid seal
- Fitted with 1 metre of PVC-sheathed thermocouple cable

Temperature range	Type J	-40°C to +750°C	Output	Type J	50µV/°C
	Type K	-40°C to +1100°C		Type K	40µV/°C
	Type T	-40°C to +400°C		Type T	40µV/°C



Probe Dia. (mm)	Mfrs. List No.	Order Code	1+	10+	25+
Type J	3.0	T/C J 3MM (IEC)	707-7373 ●	32.82	29.53
Type K	3.0	T/C K 3MM (IEC)	707-7385 ●	35.10	31.00
Type K	4.5	T/C K 4.5MM (IEC)	707-7397 ●	36.28	32.66

212237



Need a Thermometer?

See our range on page 1538

Magnetic Strip Thermocouple

Type K



Size 50 x 25, Thickness = 1

- Fast response
- Attach to any ferro-magnetic surface
- Easy and quick to position
- Can be transferred to other positions without damage



Type K surface thermocouple using a flexible magnetic strip which can be attached to any ferro-magnetic surface.

The 2m lead is terminated with a miniature thermocouple plug

Temperature range -50°C to +120°C Lead 2m PTFE insulated, twisted pair

Mfrs. List Nos: FMS-2/PLUG (IEC) = 707-7725

212147

Order Code	1+	Price Each	25+
707-7725 ●	13.85	12.50	11.16

Copper Disc Thermocouple



- Type K thermocouple junction brazed onto 7mm dia. copper disc
- Two lead length versions available, 1m and 3m
- Supplied with adhesive tape to attach to any clean surface for semi-permanent temperature measurement
- 5 adhesive tapes supplied.
- Tapes can also be used to secure the flexible PTFE lead
- For use up to 200°C

212322

Mfrs. List No.	Order Code	1+	10+	25+
Z2-K-1M DISC (IEC)	721-8771 ●	8.25	7.68	7.13
Z2-K-3M DISC (IEC)	NEW 163-3485 ●	9.70	9.03	8.37

RoHS Compliant
Non-compliant



08447 11 11 11

Fax: 08447 11 11 12

505

Leaf Thermocouple - Stainless Steel Shim

Type J or K - Up to 350°C



- Grounded tip - Fast response
- Rated at 350°C
- Glassfibre stainless steel braided extension cable, 7/0.2mm
- Stainless steel shim, 25mm long x 13mm wide

386275/406061

Description	Mfrs. List No.	Order Code	1+	10+	25+
Type J, 2m lead	FL-J-2M	859-7928 ●	11.51	10.43	9.60
Type K, 2m lead	FL-K-2M	859-7936 ●	12.43	11.26	10.38
Type K, 3m lead	FL-K-3M	NEW 163-3486 ●	14.63	13.25	12.22

Thermocouple - Washer Eyelet

Type J or K - Up to 350°C



- Grounded tip - Fast response
- Rated at 350°C
- Choice of either 2m or 3m extension cable length
- Glassfibre stainless steel braided extension cable, 7/0.2mm
- Washer with 6mm clearance hole

386277/406071

Description	Mfrs. List No.	Order Code	1+	10+	25+
Type J, 2m lead	FW-J-2M	859-7944 ●	12.00	10.85	9.94
Type J, 3m lead	FW-J-3M	NEW 163-3487 ●	14.11	12.75	11.69
Type K, 2m lead	FW-K-2M	859-7952 ●	11.26	10.27	9.46
Type K, 3m lead	FW-K-3M	NEW 163-3488 ●	13.25	12.07	11.12

Industrial Mineral Insulated Probes

Type K



- Type K mineral-insulated stainless steel sheathed probes particularly suitable for industrial applications
- Suitable for applications up to 1100 °C
- Probes can be bent to enable fitting in awkward locations
- High reliability and stability

The thermocouple junction is located at the tip and insulated from the sheath. Smaller diameter thermocouples respond to temperature changes more rapidly than larger diameters, but larger diameters are mechanically stronger. Available in a range of lengths and diameters.

Sheath material	310 stainless steel
Temperature range of probe	-40°C to 1100°C
Pot seal	M8 x 1.0mm thread L=25
Pot temperature	200°C max.
Leads	PTFE insulated 7/0.2mm, L = 100

Mfrs List No: KM/probe dia. probe length (IEC)

FOR SUITABLE COMPRESSION GLANDS SEE ORDER CODE 708-8206

222133

Probe Dia. (mm)	Probe L. (mm)	Order Code	1+	10+	25+
0.5	150	721-8898 ●	27.52	25.62	23.80
0.5	250	424-8170 ●	34.57	32.85	29.72
0.5	500	424-8181 ●	33.78	32.12	29.06
1	150	707-8110 ●	18.71	17.39	16.53
1	250	707-8122 ●	19.92	18.51	17.62
1	500	707-8134 ●	20.02	18.63	17.11
1.5	150	707-8146 ●	12.41	11.64	10.37
1.5	250	707-8158 ●	12.70	11.82	10.53
1.5	500	707-8160 ●	13.48	12.21	10.91
1.5	1000	707-8171 ●	15.59	14.80	14.49
3	150	707-8183 ●	13.64	12.68	11.51
3	250	707-8195 ●	13.95	12.88	11.64
3	500	707-8201 ●	14.65	13.13	11.72
3	1000	707-8213 ●	18.30	16.69	14.90
6	500	707-8237 ●	24.01	21.73	19.35

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Thermocouples and Probes - continued

Industrial Mineral Insulated Probes



Type N



- Suitable for applications up to 1200°C
- In vacuum or controlled atmospheres, type-N sensors can be used in excess of 1200°C
- Excellent long-term stability, reliability and high temperature performance
- Lifetime many times that of K-type equivalents at elevated temperatures
- Particularly suitable for industrial applications
- Probes can be bent to enable fitting in awkward locations

Mineral-insulated, metal-sheathed probes using type N (Nitrosil/Nisil), a base metal thermocouple which offers significant advantages over type K. The thermocouple junction is located at the tip and insulated from the sheath.

Mfrs. List No. NM1/3 150(IEC) = 707-9072, NM1/3 250(IEC) = 707-9084

Sheath material	Nickel-chromium-silicon
Max. temperature	1200°C
Pot seal	M8 x 1.0mm thread L=25mm
Pot temperature	200°C max.
Leads	PTFE insulated, L = 100mm

212330

Probe Dia. (mm)	Probe L (mm)	Mfrs. List No.	Order Code	1+	10+	25+
3	150	NM1/3X150 (IEC)	707-9072●	18.28	17.01	15.63

Industrial Mineral Insulated Probes



Type K With Standard Plug



- Type K mineral insulated thermocouples
- Very rugged and flexible
- Stainless steel (310)
- Particularly suitable for high pressure, high vacuum or high vibration applications
- Max temperature of probe 1100°C (K)
- Plain pot seal (max temp 200°C)
- 7/0.2mm PFA insulated lead 2m long

449656

Probe Dia. (mm)	Probe L (mm)	Order Code	1+	10+	25+
1	100	128-9614●	19.11	17.39	15.80
1	250	128-9617●	19.60	17.83	16.21
1	500	128-9618●	20.43	18.57	16.89
1	1000	128-9619●	22.04	20.03	18.22
1.5	100	128-9620●	18.88	17.17	15.62
1.5	150	128-9621●	19.01	17.29	15.73
1.5	250	128-9622●	19.25	17.49	15.89
1.5	500	128-9623●	19.74	17.93	16.31
1.5	1000	128-9624●	21.13	19.20	17.46
1.5	2000	128-9625●	23.60	21.45	19.50
3	100	128-9626●	19.05	17.31	15.75
3	250	128-9629●	19.57	17.79	16.18
3	500	128-9630●	20.47	18.60	16.91
3	1000	128-9631●	22.28	20.25	18.41
3	2000	128-9632●	25.88	23.55	21.40
6	100	128-9633●	20.13	18.30	16.64
6	150	128-9634●	20.83	18.94	17.22

Heavy Duty Thermocouples



- Low-cost, heavy-duty, stainless steel thermocouples for a variety of applications up to 350°C
- Probes have grounded junctions for fast response
- 2 metre leads of rugged, stainless steel braided, fibreglass

Probe L=150, Dia=4.76, Lead L=2mx7/0.2

Mfrs. List No. J-HD-150X(IEC) = 707 9436, K-HD-150X(IEC) = 707 9448

212221

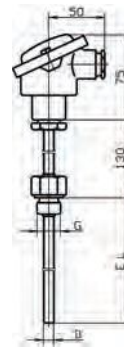
	Order Code	1+	10+	25+
Type J	707-9436●	15.04	13.29	12.12
Type K	707-9448●	15.04	13.29	12.12

Over 480,000 products online



Screw-in resistance thermometer

with terminal head Form B



Screw-in resistance thermometers are mainly used for temperature measurement in liquid and gaseous media. An important selection criterion is their reliable sealing against both negative and positive pressures. Applications can be found in air conditioning and refrigeration, as well as in heating installations, ovens and furnaces, and in equipment engineering.

For temperatures from -50 to +400°C. The terminal head is suitable for temperatures up to +100°C.

Technical Data:

Fitting Length (EL)	160mm, 250mm, 400mm
Protection Tube Diameter	9mm
Screw-in Thread	G 1/2"

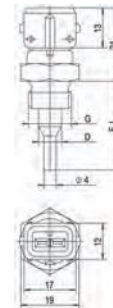
333870

Fitting Length	Order Code	1+	5+	10+
160 mm	472-4264	90.01	85.50	82.82
250 mm	472-4276	73.75	70.10	67.83
400 mm	472-4288	95.44	90.65	87.83

Screw-in resistance thermometer in stainless steel



902004 / 10



Shock-proof screw-in resistance thermometers enable temperature measurements under pressure up to 25bar, in motors, compressors and plant that are subject to particular stress.

- for temperatures from -50 to +300°C
- Highly shock-proof construction
- Connector locked in for reliable contact
- IP65 protection
- Connector with gold-plated contacts
- Protection tube in stainless steel X5 CrNi; 1810 M14 x 1.5
- Mating plug with 2.5m long silicone-insulated connecting cable, 0.34mm²

333872

Description	Order Code	1+	5+	10+
Screw-In Thermometer	472-4446	23.87	22.70	21.93
Connecting Cable	472-4458	13.44	12.78	12.35

Industrial Probes with Terminal Head



Type K



- Type K mineral-insulated thermocouple probes
- Strong 6mm diameter stainless steel stem withstands high pressures
- Waterproof terminal head gives IP67 protection
- Thermocouple junction located at tip is insulated from the sheath

The terminal head contains terminal block allowing connection to the measuring instrument via an M20 cable gland.



Sheath material 310 stainless steel
Terminal head Die cast aluminium, epoxy coated. Screwed lid with retaining chain

IP67 rated
Temperature Range -40 to 1100 °C

FOR SUITABLE COMPRESSION GLAND SEE ORDER CODE 254-654

222146

Probe Length	Mfrs. List No.	Order Code	1+	5+	10+	25+
150mm	K-150-KNE (IEC)	707-9667●	45.63	43.34	41.28	37.63
300mm	K-300-KNE (IEC)	707-9679●	47.87	45.50	43.29	39.72

Thermocouple Probe with Extension Lead



K Type Sensor - Swaged Tip



- Quick thermal response
- Rugged construction
- Suit flowing fluids, H & V applications, process plant
- 200 x 6mm stainless steel probe swaged down to 50 x 3mm
- K Type sensor
- 2 m PFA extension lead



519888

Probe Length	Mfrs. List No.	Order Code	1+	10+	25+
200mm	011051TD	163-3445●	67.98	64.58	61.18

Industrial Process Probes - Type K



Probes: Dia. = 6, L = 100, 150 Lagging extension:
Mounting: ½" BSPP male thread Dia. = 12.7, L = 75

- Accurate rugged construction
- Terminal head can accommodate DIN form transmitter or DIN terminal blocks
- Sensor is thermocouple type K to IEC 584-3, insulated from sheath
- Suitable for a wide range of industrial applications
- Wide temperature range: -100°C to +1100°C
- All stainless steel below aluminium head
- IP67 rated
- DIN terminal block is made of high temperature green plastic and has 2 terminals

This industrial thermocouple is mounted into the process via ½" BSPP male thread below which the probe length is measured. Above the thread hexagon is a stainless steel lagging extension. The sensor has a fitted aluminium terminal head with a captive threaded cover.

FOR SUITABLE THERMOCOUPLE 4 - 20MA TRANSMITTER, SEE ORDER CODE 615-687

222171

Probe Length	Mfrs. List No.	Order Code	1+	5+	10+
100mm	010012TD	725-5603●	56.32	52.39	49.82

Thermocouple Probe

K Type Sensor - Swaged Tip



- Quick thermal response
- Rugged construction
- Industrial process construction to IP67, KNE head
- 300 x 6.35mm stainless steel probe swaged down to 50 x 3mm
- M20 cable gland



519877

Probe Length	Mfrs. List No.	Order Code	1+	10+	25+
300mm	011052TD	163-3443●	80.34	76.32	72.31

Adjustable Bayonet Thermocouple

Types J and K



- Adjustable bayonet thermocouples designed primarily for the plastics and packaging industry, but recommended wherever spring loaded contact is required



- Thermocouple junction is housed in a rugged stainless steel tip
- Supplied with 2 metres of stainless steel braided lead fitted with a 170mm spring with adjustable fixing cap
- Separate bayonet adaptor locates via a ½" BSP male thread
- Fixing cap of the thermocouple is fitted to the adaptor to ensure secure spring loaded contact
- Suitable for temperatures up to 350°C

212338

	Mfrs. List No.	Order Code	1+	10+	25+	100+
Type J	J-ABT-2 (IEC)	707-9801●	14.01	13.17	12.54	11.93
Type K	K-ABT-2 (IEC)	707-9813●	16.48	15.67	15.07	13.64
Adaptor		152-239●	3.84	3.52	3.35	2.91

Welded Tip Thermocouples with Fitted Plugs



These Welded Tip Thermocouples are available in either PTFE or Glassfibre Insulation. Complete with a miniature thermocouple plug fitted, they are ready to use for most types of temperature measurement.

- Available as 1/0.2mm PTFE and 1/0.315mm Glassfibre Insulated construction
- Thermocouple types J, K, & T
- PTFE Insulation rating -75°C to +250°C
- Glassfibre Insulation rating -50°C to +350°C
- Fitted with a miniature thermocouple plug

249384

PTFE Insulation	Order Code	1+	5+	10+
Type J - 1m lead	410-0736●	5.97	5.69	5.53
Type J - 3m lead	NEW 163-3489●	7.03	6.69	6.50
Type K - 1m lead	410-0748●	4.80	4.58	4.43
Type K - 3m lead	NEW 163-3490●	7.73	7.35	7.15
Type T - 1m lead	410-0750●	5.63	5.34	5.21
Type T - 3m lead	NEW 163-3492●	7.03	6.69	6.50

PTFE Insulation

Order Code

1+

Price Each

5+

10+

Glassfibre Insulation

Type J - 2m lead

410-0761●

6.72

6.38

6.21

Type J - 4m lead

NEW 163-3493●

10.04

9.64

9.24

Type K - 2m lead

410-0773●

6.80

6.46

6.28

Type K - 4m lead

NEW 163-3494●

10.43

10.01

9.60

Thermocouple - Welded Tip

Types J, K & T



Type K, tails



Type K, mini-plug

- Fast response, exposed junction
- Thermocouples to IEC 60584
- 1/0.2mm twin twist wires
- PTFE insulated wires, class 1
- Rated from -75 to +250°C

386293

Order Multiple=Pack of 5

Description

Mfrs. List No.

Order Code

1+

Price Per Pack

5+

10+

2m twin twist cable

Type K tails

Z2-K-2 X 5

859-8150●

28.17

25.18

22.87

Type T tails

Z2-T-2 X 5

859-8169●

20.54

18.60

17.10

Type K mini-plug

Z2-K-2-MP X 5

859-8185●

22.54

20.50

18.87

Type T mini-plug

Z2-T-2-MP X 5

859-8193●

27.48

24.49

22.20

Type J mini-plug

Z2-J-2-MP X 5

859-8215●

28.17

24.90

22.42

1m twin twist cable

Type K tails

Z2-K-1 X 5

859-8223●

15.73

14.08

12.82

Type T tails

Z2-T-1 X 5

859-8231●

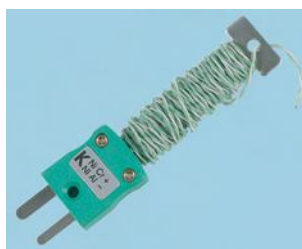
14.21

12.81

11.72

Thermocouple - Fine Wire

Type K - 220°C



- Class 1 PFA insulated wire - High accuracy
- Rated at 220°C continuous (plug), 250°C (PFA)
- 2m wire stored on stainless steel stem with fitted mini-plug
- High sensitivity, fast response

386279

Description	Mfrs. List No.	Order Code	1+	5+	10+
Type K, 2m lead length					
Twin twist, 1/0.2mm	CT-Z2-PFA-K-2	859-8118●	14.66	13.33	12.26
Flat pair, 1/0.315mm	CT-Z4-PFA-K-2	859-8126●	16.91	15.36	14.14

Industrial Mineral Insulated Probes

Type K With 1m Lead



- Type K mineral insulated thermocouples
- Stainless Steel (316)
- Very Flexible
- Plain pot seal
- 1m PTFE flat pair 7/0.2mm cable
- Duplex types (2 thermocouples in one probe) available

Mineral insulated thermocouples are extremely rugged and flexible, able to withstand temperatures up to 1100°C (pot seal max temp 180°C).

The probes can be bent to enable fitting in awkward locations, they are particularly suitable for industrial applications including high pressure, high vacuum, and high vibration.

The thermocouple junction is located at the tip of the sensor and is insulated from the sheath

FOR SUITABLE COMPRESSION GLANDS SEE ORDER CODE 708-8206

249373

Probe Dia. (mm)	Probe L (mm)	Order Code	1+	5+	10+
Standard Thermocouple					
1	100	128-9641●	17.50	15.90	14.47
1	250	128-9642●	17.99	16.36	14.86
1.5	150	424-8193●	16.14	15.33	13.87
1.5	250	424-8200●	17.47	16.59	15.01



Thermocouples and Probes - continued

Industrial Mineral Insulated Probes - continued

Type K With 1m Lead - continued

Probe Dia. (mm)	Probe L (mm)	Order Code	1+	5+	10+
Standard Thermocouple					
1.5	2000	128-9647●	22.07	20.08	18.25
3	150	424-8211●	18.12	17.20	15.57
3	250	424-8223●	18.64	17.71	16.02
3	500	128-9648●	18.39	16.72	15.20
6	150	424-8235●	20.51	19.49	17.63
6	250	424-8247●	22.44	21.32	19.28
Duplex Thermocouple					
3	150	424-8259●	28.85	27.41	24.80

Industrial Mineral Insulated Probes

Type K With Miniature Plug



Mineral insulated thermocouples are extremely rugged and flexible, able to withstand temperatures up to 1100°C (plug max temp 220°C).

The probes can be bent to enable fitting in awkward locations, they are particularly suitable for industrial applications including high pressure, high vacuum, and high vibration.

The thermocouple junction is located at the tip of the sensor and is insulated from the sheath

- Type K mineral insulated thermocouples
- Very Flexible
- Stainless Steel (316)
- Direct connection to miniature plug

FOR SUITABLE COMPRESSION GLANDS SEE ORDER CODE 708-8206

249378/406072

Probe Dia. (mm)	Probe L (mm)	Order Code	1+	5+	10+
Standard Thermocouple					
0.5	150	424-8296●	29.29	27.83	25.18
0.5	250	424-8302●	32.23	30.61	27.69
0.5	500	128-9600●	34.66	31.54	28.86
0.5	1000	128-9601●	39.15	35.81	32.60
1.5	150	424-8314●	15.29	14.53	13.15
1.5	250	424-8326●	15.71	14.90	13.50
1.5	500	128-9602●	15.62	14.19	12.91
1.5	1000	128-9604●	16.86	15.33	13.95
3	150	424-8338●	15.53	14.75	13.35
3	250	424-8340●	16.06	15.25	13.81

Nozzle Thermocouple - Threaded Bolt

Type J or K - Up to 350°C



- Grounded tip - Fast response
- Tip shape matches drill angle in blind holes
- Adjustable insertion
- M6 x 1mm threaded stainless steel bolt
- Not sealed
- Glassfibre stainless steel braided extension lead, 7/0.2mm

386270

Description	Mfrs. List No.	Order Code	1+	10+	25+
Type J, 2m lead	FN-J-2M	859-8045●	16.10	14.62	13.45
Type K, 2m lead	FN-K-2M	859-8053●	17.25	15.66	14.40

Handheld Probes - Type K

Fixed Probes



Insertion
Overall L=200
Probe L=105
Dia=3.3
Lead L=2mm



Surface, disc
Overall L=195, Probe L=80, Dia=4.7, Lead L=1.5mm

Surface, coil
Overall L=220, Probe L=108, Dia=7.9, Lead L=1.5mm

Air
Overall L=187, Probe L=74, Dia=4.7, Lead=1.5mm



- Hand-held type K thermocouple probes with stainless steel sheath
- Fitted with coiled PVC lead terminated with miniature thermocouple plug

Insertion probe: Tapered tip suitable for general purpose temperature measurement, immersion in liquids and penetration of semi-solids and solids including frozen food, grain etc. Maximum temperature 400°C.

Choice of **surface probes:** **Disc-type** features a spring-loaded thermocouple with copper 4mm diameter disc tip, operates up to 850°C. **'Coil' type** features a ceramic tip and coiled element for fast response, improved accuracy and maximum temperature of 900°C. Diameter of coiled element is 5.5mm.

Air probes: Thermocouple junction protected by perforated sheath allowing the free passage of gases, for fast response measurement up to 750°C.

212446

Type	Mfrs. List No.	Order Code	1+	10+	25+
Insertion	Q-K (IEC)	708-1170●	38.14	34.36	30.69
Surface, disc	A-K (IEC)	708-1182●	29.22	27.32	24.74
Surface, coil	C-K (IEC)	708-1194●	33.21	30.97	28.24
Air	L-K (IEC)	708-1200●	26.82	23.75	21.96

Thermocouple Cables

General Data

Thermocouple Extension and Compensation Cable

Extension cable has a temperature v e.m.f. relationship to the appropriate standard over the complete temperature range. It can, therefore, be used for producing a thermocouple junction and for joining thermocouples to their measuring instruments. It is limited in temperature, only by the rating of its insulation.

Compensating cable is of different composition to extension cable but has a similar temperature v e.m.f. relationship over a limited range, and **should only be used for joining thermocouples to their measuring instruments**. It can only be used in a limited ambient temperature, generally not higher than 80°C.

Ordinary copper wires and connectors should never be used to join thermocouples to instruments-substantial errors can result. Use only thermocouples compensating or extension cable and thermocouple connectors.

Guide to wire and Cable Insulation

Insulation Material	Usable Temperature Range	Application Guide
PVC	-10°C to 105°C	Good general-purpose insulation for 'light' environments. Waterproof and very flexible.
PTFE	-75°C to 250/300°C	Resistant to oils, acids, other adverse agents and fluids. Good mechanical strength and flexibility.
Glass-fibre (varnished)	-60°C to 350/400°C	Good temperature range but will not prevent ingress of fluids. Fairly flexible but does not provide good mechanical protection.
Glass-fibre (varnished) stainless steel overbraid	-60°C to 350/400°C	Good resistance to physical disturbance and high temperature (up to 400°C). Will not prevent ingress of fluids.

Single or Multi-Strand?

The choice is mainly determined by the application (e.g. termination considerations and internal diameter of associated sheath). Generally, single-strand wires are used for thermocouple junctions and multi-strand or thicker single-strand for extensions of the thermocouple. The greater the effective conductor diameter, the lower the value of thermocouple loop resistance, an important consideration with long cable runs.

Source: LABFACILITY TEMPERATURE HANDBOOK- Order Code 656-069.

229884

PVC Insulated Screened Copper Cable

For use with PRT Sensors



- Core colours red & white
- 4 core, 7/0.2 PVC/screened/PVC insulated
- Copper cable for use with platinum resistance thermometers and most process signals
- Insulation temperature rating 105°C

449686

Length	Order Code	1+	10+	25+
50m	128-9660●	61.57	55.98	51.32

Thermocouple Cables Type J & K

PVC Flat Pair



Un-screened Type J

386260

Description	Mfrs. List No.	Order Code	1+	10+	25+
Unscreened 7/0.2 100m					
Type K	WK-150	859-8460●	65.33	59.40	54.72
Type J	WJ-200	859-8479●	41.92	37.56	34.18
Screened Extension Cable, 7/0.2					
Type K, 100m	WK-359	859-8487●	90.13	81.94	75.49
Type J, 100m	WJ-241	859-8495●	71.92	64.99	59.61

Extension Cable and Compensating Cable, PVC

Types J, K, T, N, R/S and Vx



Colour coded to BS4937 Part 30:1993.

Extension Cable

Extension cable suitable for thermocouples. The cable is 7/0.2 twin flat with PVC covered conductors with an overall sheath of PVC. The cable is ideally suited for extending thermocouples away from the heat source via the connectors listed below.

Compensating Cable (Type K)

The Vx cable is type K compensating at ambient temperatures up to 80°C.

Mfrs. List No.	WJ-200/10M (IEC)	= 708-2289	WV-100/25M (IEC)	= 708-2370
	WJ-200/50M (IEC)	= 708-2290	WJ-200/10M (IEC)	= 708-2289
	WK-150/10M (IEC)	= 708-2307	WT-009/50M (IEC)	= 708-2368
	WK-150/50M (IEC)	= 708-2319	WV-009/100M (IEC)	= 708-2400
	WN-001/10M (IEC)	= 708-2320	WU-100/100M (IEC)	= 708-2423
	WT-200/50M (IEC)	= 708-2344		

212427

Extension Cable	Order Code	1+	5+	10+	25+
Type J, 7/0.2mm 10m	708-2289●	6.10	5.52	5.22	4.83
Type J, 7/0.2mm 50m	708-2290●	30.13	28.09	25.73	23.22
Type K, 7/0.2mm 10m	708-2307●	12.26	11.59	10.81	9.65
Type K, 7/0.2mm 50m	708-2319●	59.04	56.21	51.78	44.73
Type N, 7/0.2mm 10m	708-2320●	10.15	9.12	8.16	7.38
Type T, 7/0.2mm 50m	708-2344●	28.17	25.35	22.64	20.49
Type T, 13/0.2mm 50m	708-2368●	33.78	30.43	27.17	24.59
Compensating Cable					
Type Vx (K), 7/0.2mm 25m	708-2370●	11.25	10.17	9.06	8.07
Type Vx (K), 13/0.2mm 100m	708-2400●	55.21	49.68	44.40	40.17
Type RC/SC, 13/0.2mm 100m	708-2423●	55.21	49.68	44.40	40.17

Extension Cable, PTFE

Types K and T



- Flexible extension cable for types K and T thermocouples
- Comprises pair of PTFE-insulated flexible conductors with overall flat PTFE sheath
- Good chemical resistance

Conductor size 7/0.2mmmm
Approx. overall size 2.4 x 2mm
Maximum continuous temperature 250°C

212332

	Mfrs. List No.	Order Code	1+	10+	25+
Type K, 25m	WK-302/25M (IEC)	708-5904●	51.60	46.42	41.48
Type T, 25m	WT-046/25M (IEC)	708-5916●	47.32	42.59	38.03

Extension Cable, Glass Fibre Insulated

Types J, K and T



- Suitable for high ambient temperature applications
- Each conductor insulated with silicon varnish-impregnated fibre glass
- Overall fibre glass sheath impregnated with silicon varnish

	Type J	Type K
Wire diameter	1/0.315mm	1/0.315mm
Overall diameter	1.5mm	1.5mm
Max continuous temperature	350°C	350°C
Positive conductor	Iron	Nickel chromium
Negative conductor	Constantan	Nickel chromium

212438

	Mfrs. List No.	Order Code	1+	10+	25+
Type J, 10m coil	WJ-032/10M (IEC)	708-5928●	8.48	7.84	7.00
Type K, 10m coil	WK-041/10M (IEC)	708-5930●	8.48	7.84	7.68
Type K, 50m reel	WK-041/50M (IEC)	708-5941●	42.19	37.27	34.03
Type T, 10m coil	WT-056/10M (IEC)	708-5953●	8.45	7.60	6.80

Extension Cable with Stainless Steel Overbraid

Glass Fibre, Types J and K



- Rugged extension cable for types J and K thermocouples
- Excellent mechanical protection
- Flexibility
- High temperature resistance
- Overbraid can be used for electrical screening

Conductor size 7/0.2mmmm
Approx. overall size 1.6 x 2.4mm
Maximum continuous temperature 350°C

Cable comprises one pair of glass fibre insulated flexible conductors, a glass fibre sheath and an overall rugged stainless steel braid.

212333

	Mfrs. List No.	Order Code	1+	10+	25+
Type K 25m	WK-075/25M (IEC)	708-6337●	51.83	46.64	41.65
Type J 25m	WJ-040/25M (IEC)	708-6349●	39.43	35.48	31.69

Screened Extension and Compensating Cable

Types K and Vx



Screened thermocouple cable reducing electromagnetic and electrostatic interference of thermocouple signals. The cable comprises one pair of stranded 7/0.2mm conductors, PVC

insulated and twisted together. The pair are screened with mylar/aluminium tape in contact throughout with a copper drain wire. The cable has an overall round PVC sheath, approximate diameter 5mm.

Maximum temperature 105°C (type K) and 80°C (type Vx).

Mfrs. List No. WK-074/10M (IEC) = 708-6131, WK-074/50M (IEC) = 708-6143,
WV-029/100M (IEC) = 708-6155

212222

	Order Code	1+	10+	25+
Extension Cable				
Type K 10m coil	708-6131●	15.68	13.85	12.64
Type K 50m coil	708-6143●	70.85	63.76	60.51
Compensating Cable				
Type Vx (K) 100m reel	708-6155●	52.44	46.31	42.29

Thermocouple wire, PTFE TW-TW



- PTFE insulated, twin-twist construction
- 1/0.2mm diameter conductor
- Thermocouple types J, K, T
- High accuracy Class 1 tolerance
- Insulation rating -75°C to +250°C
- Supplied on 25m, 50m or 100m reels

231796

Thermocouple Type	Order Code	1+	10+	25+
Type J x 25M Reel	335-8150●	15.23	14.47	13.82
Type K x 25M Reel	335-8161●	14.06	13.38	12.74
Type K x 50M Reel	NEW 163-3495●	28.33	27.19	26.06
Type K x 100M Reel	NEW 163-3497●	59.23	56.86	54.49
Type T x 25M Reel	335-8173●	12.19	11.59	11.06
Type T x 50M Reel	NEW 163-3498●	23.18	22.25	21.32
Type T x 100M Reel	NEW 163-3499●	43.78	42.02	40.27

Self-adhesive Attachment Pads



- Self-adhesive PTFE coated glass cloth
- Each pad has pre-cut hole through which thermocouple junction is passed and held down in contact with surface to be measured
- Temperature range -50°C to +250°C
- Supplied in pack of 20

Pad (nom.) = 18x13

Self-adhesive pads for locating welded tip thermocouples.

212325

20 Per Pack	Order Code	1+	10+	25+
Mfrs. List No.				
THERMOPADS (X20)	721-8849●	3.20	2.88	2.71

700 products added online every week

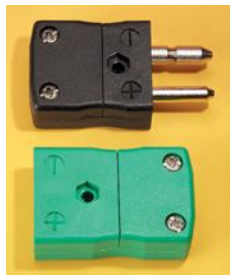


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Thermocouple Connectors and Accessories

Connectors - Standard Types J, K, R/S, T and Copper



- A range of standard sized connectors with round pins to suit the thermocouple type being used
- Intended for use in more industrial applications
- All contacts are polarised to ensure correct connection
- Maximum continuous operating temperature 220°C
- Cable clamps available for securing cable to free plugs and sockets
- Colour coded to **BS4937 Part 30:1993**

212475

Line Plug	Order Code	1+	10+	25+	100+	500+
Type J	148-823●	3.42	3.22	3.07	2.98	2.82
Type K	708-7925●	3.42	3.22	3.07	2.98	2.82
Type T	381-0215●	3.42	3.34	3.07	2.98	2.82
Type R	708-7950●	3.42	3.22	3.07	2.94	2.81
Line Socket						
Type J	148-824●	3.11	2.97	2.82	2.71	2.60
Type K	708-7937●	3.11	2.97	2.82	2.71	2.60
Type T	381-0240●	3.11	2.97	2.82	2.71	2.60
Type R	708-7962●	3.11	2.97	2.82	2.65	2.55

Connectors, Standard, Quick Wire Types J and K



- Physically compatible with alternative standard, round pin connectors
- These quick connect versions allow rapid termination
- Quick, easy 'jab-in' connection just push in wire and tighten screw
- Wide range of wire sizes
- 220°C continuous rating
- IEC colour coded bodies to **BS4937 Part 30:1993**

231221

	Mfrs. List No.	Order Code	1+	10+	25+	100+	500+
Quick Wire Plug							
Type J	IS-J-MQ	381-0264●	3.75	3.56	3.43	3.28	3.13
Type K	IS-K-MQ	381-0276●	3.75	3.56	3.43	3.28	3.13
Quick Wire Socket							
Type J	IS-J-FQ	381-0320●	4.00	3.78	3.62	3.50	3.34
Type K	IS-K-FQ	381-0331●	4.00	3.78	3.62	3.50	3.34
Accessories							
Cable Clamp	FSTC-EXCL	674-084●	2.26	2.04	1.85	1.69	1.55

Thermocouple Connectors Standard Line Pairs



- Polarised to ensure correct connection
- 220°C continuous rating

386256

Description	Mfrs. List No.	Order Code	1+	10+	25+	100+
Type J	IS-J-M/F	859-8363●	6.57	5.88	5.34	4.86
Type K	IS-K-M/F	859-8371●	6.21	5.56	5.07	4.63

Thermocouple Connectors Miniature Sockets



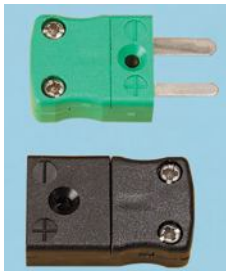
High quality, low cost, single sprung sockets which accept all types of flat pin miniature plugs

- Polarised to ensure correct connection
- 220°C continuous rating

386246

Description	Mfrs. List No.	Order Code	1+	10+	25+
Type J	IM-J-LCF	859-8274●	2.03	1.82	1.67
Type K	IM-K-LCF	859-8282●	2.03	1.82	1.67

Connectors, Miniature Types, J, K, N, T and Copper



- Range of miniature thermocouple connectors with flat pins having terminal and contact material to suit the thermocouple type
- Uncompensated copper connectors also available (colour white)
- All contacts are polarised to ensure correct connection
- Connectors will accept thermocouple cable up to 3mm diameter
- Maximum operating temperature 220°C
- Cable clamps available for securing cable to free plugs and sockets

212465

Line Plug	Order Code	1+	10+	25+	100+	500+
Type J	151-128●	2.05	1.97	1.93	1.80	1.74
Type K	708-6362●	2.05	1.97	1.93	1.80	1.74
Type N	708-6430●	2.05	1.97	1.93	1.80	1.74
Type T	708-6404●	2.05	1.97	1.93	1.80	1.74
Copper	721-8874●	2.05	1.97	1.93	1.80	1.74
Line Socket						
Type N	708-6428●	2.22	2.13	2.08	2.04	1.89
Copper	721-8862●	1.67	1.61	1.58	1.54	1.42

Thermocouple Connectors Miniature Line Pairs



- Single sprung contact socket
- Polarised to ensure correct connection
- 220°C continuous rating
- Interchangeable with all types of flat pin miniature connectors

386254/406073

Description	Mfrs. List No.	Order Code	1+	10+	25+	100+
Type T	IM-T-M/LCF	859-8320●	4.32	3.90	3.58	3.28
Type J	IM-J-M/LCF	859-8339●	4.32	3.90	3.58	3.28
Type K	IM-K-M/LCF	859-8347●	4.32	3.90	3.58	3.28

Connectors, Miniature, Quick Wire Types J and K



- These quick connect versions allow rapid termination
- Quick, easy 'jab-in' connection just push in wire and tighten screw
- Wide range of wire sizes
- 220°C continuous rating
- IEC colour coded bodies to **BS4937 Part 30:1993**

231275

Order Code	1+	10+	25+	100+	500+
Quick Wire Plug					
Type J 381-0380●	2.22	2.12	2.02	1.96	1.84
Type K 381-0392●	2.35	2.24	2.14	2.06	1.96
Type T 381-0409●	2.35	2.24	2.14	2.06	1.96
Type N 381-0410●	2.35	2.24	2.14	2.06	1.96
Copper 381-0422●	2.22	2.12	2.02	1.96	1.84
Quick Wire Socket					
Type J 381-0434●	2.22	2.12	2.02	1.96	1.84
Type K 381-0446●	2.35	2.24	2.14	2.06	1.96
Type N 381-0458●	2.35	2.24	2.14	2.06	1.96
Type T 381-0460●	2.22	2.12	2.02	1.96	1.84
Copper 381-0471●	2.35	2.24	2.14	2.06	1.96

Quick Wire Thermocouple Connectors

Panel fitting, miniature



- Stainless steel brackets
- Reliable and rugged fitting into panel
- Quick, easy "jab-in" connection. Push in wire and tighten screw
- Maximum continuous operating temperature 220°C

386251

Description	Mfrs. List No.	Order Code	1+	10+	25+
Type T	IM-T-LCF	859-8266●	2.03	1.82	1.67
Type K	IM-K-SSPFQ	859-8304●	4.37	3.88	3.52

Very High Temperature Plastic Plugs and Sockets

Miniature and Standard Type K



Miniature plug



Miniature socket

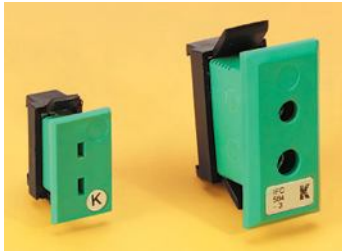
- Type identification on white body
- 560°C continuous rating
- Heavy duty ceramic body

386259/406077

Description	Mfrs. List No.	Order Code	1+	10+	25+	100+
Miniature, Very High Temperature						
Type K - Plug	IM-K-M-HTC	859-8428●	6.98	6.36	5.86	5.37
Type K - Socket	IM-K-F-HTC	859-8436●	9.24	8.41	7.75	7.12
Standard, Very High Temperature						
Type K - Plug	IS-K-M-HTC	859-8444●	10.83	9.85	9.05	8.33
Type K - Socket	IS-K-F-HTC	859-8452●	9.70	8.81	8.13	7.46

Connectors, Panel, Clip Mount

Types J, K, N, T, R and Copper



- Quick, simple fixing to panel
- Rated for use up to 220°C

Dimensions:
 Miniature:- H = 23.30, W = 14.25, D = 21.50
 Standard:- H = 38.10, W = 18.50, D = 31.50

231277

	Order Code	1+	10+	25+	100+	500+
Miniature						
Type J	151-130●	2.59	2.44	2.40	2.31	2.20
Type K	708-6386●	2.59	2.44	2.40	2.31	2.20
Type N	708-6441●	2.59	2.44	2.40	2.31	2.20
Type T	708-6416●	2.59	2.44	2.40	2.31	2.20
Copper	721-8886●	2.59	2.44	2.40	2.31	2.20
Standard						
Type J	148-825●	3.34	3.17	3.03	2.94	2.79
Type K	708-7949●	3.34	3.17	3.03	2.94	2.79
Type T	381-0495●	3.28	3.10	2.98	2.87	2.74
Type R	708-7974●	3.34	3.17	3.03	2.88	2.77

Connectors, Panel, Stainless Steel Bracket

Types K, N and T



- These miniature sockets supplied with stainless steel brackets allow reliable fitting into panels
- Quick, simple fixing to connector
- Allows continuous use at 220°C
- Rugged fitting into panel

231279



	Order Code	1+	10+	25+	100+	500+
Miniature						
Type K	381-0525●	4.39	4.17	4.00	3.84	3.67
Standard						
Type K	381-0574●	6.91	6.58	6.27	6.08	5.78

Connectors, Miniature, PCB

Type K

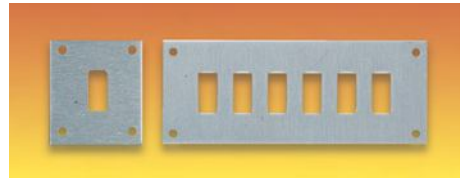


- Versatile, high quality, circuit board mounting miniature socket
- Specially designed for PCB's
- High reliability interconnection for high duty use
- Solid pins for direct PCB mounting
- Provision for CJC sensor
- 220°C continuous rating
- Colour coded to BS4937 Part 30:1993

231280

	Order Code	1+	10+	25+	100+	500+
Type K	381-0628●	2.69	2.58	2.45	2.37	2.25

Connector Panels



Miniature, 1-way: L=40, H=45, 6-way: L=115, H=45

Standard, 1-way: L=50, H=66, 6-way: L=145, H=66, Thickness= 1.8 (miniature), 2.4 (standard)

- Anodised aluminium panels with pre-cut holes for mounting thermocouple panel sockets
- 1 way and 6 way panels are available for miniature and standard sized clip mounting panel sockets (not suitable for screw mounting panel sockets)
- Four fixing holes

212334

	Mfrs. List No.	Order Code	1+	10+	25+
Miniature, 1-way	FMP-1	708-8152●	1.34	1.27	1.21
Miniature, 6-way	FMP-6	708-8164●	2.38	2.14	2.03
Standard, 6-way	FSP-6	708-8188●	5.19	4.67	4.42

Connector Blocks



- Blocks can be interlocked to produce required number of channels (max 5) and allowing thermocouple types to be mixed
- Each block has 2 fixing holes

Connecting blocks with single pair of positive and negative contacts of thermocouple material.

Block L = 36, W = 30, H = 13

Max. working temperature 220°C
 Wire size for crimp terminals 0.5 to 1mm (0.2 to 0.8mm²), 25-19 SWG

212335

	Order Code	1+	5+	10+	25+
Connector Block					
Type J	721-8783●	3.70	3.51	3.34	3.20
Type K	721-8795●	3.70	3.51	3.34	3.20

Bench Selector Switch - Type K



H=57, W=130, D=145



- 6 way bench selector switch in moulded housing with aluminium front and rear panels
- Allows up to 6 type K sensors to be measured by one instrument
- Inputs/output via miniature thermocouple sockets

222182

Mfrs. List No.	Order Code	1+	5+	10+
TCS-6K (IEC)	708-8190●	83.37	80.25	77.26

Thermocouple Connectors and Accessories - continued

Thermocouple and Fine Wire Welder



The L60+ welder is designed for sensor manufacturers to produce commercial grade thermocouple junctions, and by users of large numbers of exposed junction thermocouples such as test and development laboratories where multi-point temperature sensing of test pieces is required. No special skills are required and most people will be capable of producing quality work with minimal practice. A satisfactory thermocouple junction is produced without using argon, but where argon is available a momentary purge is automatically triggered immediately prior to the weld to give optimum weld integrity.

- Designed For Producing Thermocouple Junctions
- Suitable for wires up to 1.1mm diameter
- Argon gas shield facility
- Can join wires to each other or metal surfaces
- Includes footswitch for convenient operation
- 110/230Vac power supply

249383

Order Code	1+	Price Each	5+	10+
410-0669●	980.84	931.79		906.89

Compression Glands Brass - BSPP Thread



- Brass compression glands suitable for fitting temperature sensor probes of various diameters
- Available in 1/8" and 1/4" BSPP Thread sizes
- Suitable for probe diameters of 3, 4.5 and 6mm

519779

Bore Dia.	Mfrs. List No.	Order Code	1+	Price Each	10+	25+
1/8" BSPP Thread size						
1mm	FC-003	163-3385●	2.68	2.54	2.41	
3mm	FC-009	163-3386●	2.68	2.54	2.41	
4.5mm	FC-012	163-3388●	3.09	2.94	2.78	
1/4" BSPP Thread size						
3mm	FC-031	163-3389●	5.67	5.39	5.10	
4.5mm	FC-038	163-3390●	5.67	5.39	5.10	
5mm	FC-036	163-3391●	5.67	5.39	5.10	

Compression Glands Stainless Steel - BSPP Thread



- Stainless Steel 304 compression glands suitable for fitting temperature sensor probes of various diameters
- Available in 1/8", 1/4" and 1/2" BSPP Thread sizes
- Suitable for probe diameters of 1.5, 3, 4.5 and 6mm

519805

Bore Dia.	Mfrs. List No.	Order Code	1+	Price Each	10+	25+
1/8" BSPP Thread size						
1.5mm	FC-132	163-3392●	4.74	4.50	4.26	
3mm	FC-140	163-3393●	5.15	4.89	4.64	
4.5mm	FC-143	163-3394●	5.15	4.89	4.64	
6mm	FC-138	163-3395●	5.15	4.89	4.64	
1/4" BSPP Thread size						
3mm	FC-159	163-3396●	7.73	7.34	6.95	
4.5mm	FC-166	163-3397●	7.73	7.34	6.95	
6mm	FC-168	163-3398●	7.73	7.34	6.95	
1/2" BSPP Thread size						
3mm	FC-199	163-3400●	10.30	9.79	9.27	
4.5mm	FC-205	163-3401●	10.30	9.79	9.27	
6mm	FC-201	163-3402●	10.30	9.79	9.27	

Compression Glands Brass - BSPT Thread



- Brass compression glands suitable for fitting temperature sensor probes of various diameters
- Available in 1/8", 1/4" and 1/2" BSPT Thread sizes
- Suitable for probe diameters of 1.5, 3, 4.5 and 6mm

519811

Bore Dia.	Mfrs. List No.	Order Code	1+	Price Each	10+	25+
1/8" BSPT Thread size						
1.5mm	FC-001	708-8206●	2.76	2.61	2.49	
3mm	FC-002	708-8218●	2.93	2.75	2.63	
4.5mm	FC-005	163-3403●	3.30	3.13	2.97	
6mm	FC-011	708-8220●	3.02	2.69	2.58	
1/4" BSPT Thread size						
3mm	FC-029	163-3404●	5.67	5.39	5.10	
4.5mm	FC-032	163-3406●	5.67	5.39	5.10	
6mm	FC-037	163-3407●	5.67	5.39	5.10	
1/2" BSPT Thread size						
6mm	FC-092	163-3408●	6.59	6.26	5.93	

Compression Glands Stainless Steel - BSPT Thread



- Stainless Steel 304 compression glands suitable for fitting temperature sensor probes of various diameters
- Available in 1/8", 1/4" and 1/2" BSPT Thread sizes
- Suitable for probe diameters of 1, 1.5, 3, 4.5 and 6mm

519814

Bore Dia.	Mfrs. List No.	Order Code	1+	Price Each	10+	25+
1/8" BSPT Thread size						
1mm	FC-130	541-060●	5.11	4.66	4.09	
1.5mm	FC-131	254-630●	5.09	4.65	4.07	
3mm	FC-133	254-642●	8.51	7.70	6.87	
4.5mm	FC-141	163-3409●	5.15	4.89	4.64	
6mm	FC-136	163-3410●	5.15	4.89	4.64	
1/4" BSPT Thread size						
3mm	FC-158	163-3411●	7.73	7.34	6.95	
4.5mm	FC-162	163-3412●	7.73	7.34	6.95	
6mm	FC-167	254-654●	8.97	7.53	6.59	
1/2" BSPT Thread size						
4.5mm	FC-208	163-3413●	10.92	10.37	9.83	
6mm	FC-200	163-3414●	10.30	9.79	9.27	

Compression Gland Flange Brass and Stainless Steel - BSPP Thread



- Stainless Steel 304 and Brass flanges for fitting temperature sensor probes of various diameters
- Used in conjunction with appropriate compression gland

- Available in 1/8" (Brass), and 1/2" BSPT (Stainless Steel)
- 50mm Diameter
- 3 x 4mm mounting holes

519819

Bore Dia.	Mfrs. List No.	Order Code	1+	Price Each	10+	25+
1/8" BSPP Thread size						
Brass	CA-251	163-3415●	10.92	10.37	9.83	
1/2" BSPP Thread size						
Stainless Steel	CA-252	163-3416●	17.51	16.64	15.76	

Probe Accessories Adaptors and Cap



Bayonet Cap
For use with 163-3423



163-3420



1633423

- Bright nickel plated range of cap and adaptors
- Cap has grub screw fixing to probe
- Adaptors available in 1/8" BSPP and M10 x 1 thread sizes
- Suit probe diameters up to 6mm

519827

Fixing	Mfrs. List No.	Order Code	1+	Price Each	10+	25+
Bayonet Cap						
2 Slot	CA-304	163-3418●	7.73	7.34	6.95	
Bayonet Adaptor						
1 Pin	CA-401	163-3420●	2.35	2.24	2.11	
1 Pin	CA-402	163-3421●	2.58	2.45	2.32	
1 Pin	CA-403	163-3422●	2.88	2.74	2.60	
2 Pin	CA-404	163-3423●	3.30	3.13	2.97	
1 Pin	CA-405	163-3424●	2.58	2.45	2.32	

Locknuts

Brass and Stainless Steel



New

519869

Thread Size	Mfrs. List No.	Order Code	1+	10+	25+
Brass					
M8 x 1mm	FL-240	163-3434●	0.89	0.85	0.79
1/8" BSP	FL-236	163-3435●	0.89	0.85	0.79
1/4" BSP	FL-235	163-3436●	1.44	1.37	1.30
1/2" BSP	FL-237	163-3437●	2.37	2.26	2.13
Stainless Steel					
M8 x 1mm	FL-253	163-3438●	0.95	0.90	0.86
1/8" BSP	FL-250	163-3439●	0.95	0.90	0.86
1/4" BSP	FL-252	163-3440●	1.55	1.47	1.39
1/2" BSP	FL-255	163-3441●	2.58	2.45	2.32

Thermopocket

Stainless Steel



New

519851

- Process connection 1/2" BSP
- 1/8" BSP sensor connection
- Outside diameter 7/16"
- Wall thickness 0.08"
- Sensor probe should be 50mm longer than pocket stem

Pocket Length	Mfrs. List No.	Order Code	1+	10+	25+
100mm	TP-100-X	673-961●	22.15	21.03	20.01
150mm	TP-150-X	163-3426●	24.72	23.48	22.25
250mm	TP-250-X	673-973●	24.01	22.82	21.73
350mm	TP-350-X	708-8279●	25.42	24.13	23.00
550mm	TP-550-X	163-3427●	30.69	29.16	27.63

Thermopocket

Stainless Steel



New

519837

- Process connection 1/2" BSP
- 1/8" BSP sensor connection
- To suit up to 6.35 x 200mm probes
- 6.35mm bore

- 12mm pocket diameter x 150mm length
- Sensor probe should be 50mm longer than pocket stem

Mfrs. List No.	Order Code	1+	10+	25+
LB-003	163-3425●	50.47	47.95	45.42

Thermopocket

Stainless Steel



New

519866

- Process connection 1/2" BSP
- Fabricated construction
- 316 grade stainless steel
- A 1/8" BSP compression fitting is supplied to suit probe diameter 3mm to connect sensor to pocket
- Pressure rated (1000psi)
- Sensor probe should be 50mm longer than pocket stem

Pocket Length	Mfrs. List No.	Order Code	1+	10+	25+
100	010125TD	163-3432●	24.51	23.29	22.06
150	010126TD	163-3433●	25.34	24.07	22.80

Tapered Thermowell

Solid Drilled Stainless Steel



New

519864

- Machined from solid 316 grade stainless steel
- Process connection 1/2" BSP
- A 1/8" BSP compression fitting to suit probe diameter up to 6mm is required to connect sensor to pocket
- High pressure rated (5000psi)
- 12mm outside diameter (at tip)
- Sensor probe should be 50mm longer than pocket stem

Pocket Length	Mfrs. List No.	Order Code	1+	10+	25+
100mm	LB-007	163-3428●	37.60	35.72	33.84
150mm	LB-008	163-3431●	46.35	44.03	41.72

Terminal Heads

IP 67



New

520113

Entry Types Cable	Process	Mfrs. List No.	Order Code	1+	10+	25+
Cast Aluminium						
M20 x 1.5	1/2" BSP	HB-013	163-3469●	9.17	8.71	8.25
M16 x 1.5	1/8" BSP	HB-015	163-3470●	6.80	6.46	6.12
Stainless Steel						
M20 x 1.5	1/2" BSP	HB-018	163-3471●	50.47	47.95	45.42
Moulded ABS						
M20 x 1.5	1/2" BSP	HB-020	163-3472●	24.72	23.48	22.25

Terminal Blocks

In-head Mounting



New

519898

- Moulded blocks and Ceramic blocks
- Designed for In-head mounting

Description	Mfrs. List No.	Order Code	1+	10+	25+
Ceramic Block					
3 Ways KNS Head	HT-061	163-3450●	2.47	2.35	2.23
4 Ways DIN B	HT-040	163-3451●	5.15	4.89	4.64
6 Ways DIN A/B	HT-060	163-3452●	7.00	6.65	6.30
Moulded Block					
Single DIN B	HT-058	163-3453●	4.53	4.31	4.08
Duplex DIN B	HT-059	163-3455●	4.94	4.70	4.45
Single DIN B	HT-053	163-3456●	4.33	4.11	3.89
Duplex DIN B	HT-056	163-3457●	4.64	4.41	4.17

PT100 or Thermocouple to 4-20mA



- Two transmitters, one PT100 input, one J, K or T thermocouple input (user selectable)
- Both have 4-20mA output
- Din sized for in head installation
- Screw terminals for inputs and outputs
- Corrosion resist plastic case
- 0.2°C accuracy
- Tested to EN55011, IEC 801-2, 3, 4 for EMC compatibility

H = 23.0, Dia. = 41.8
 2 Mounting holes dia. 5.5 @ 33 cntrs.
 Centre hole (sensor wire entry) Dia. = 4.0mm

Output	4-20mA loop powered max. 30mA
Loop supply	10 to 30 Vdc reverse polarity protection
Loop resistance	700Ω @ 24V
Loop sensitivity	10μA/volt
Temperature stability	Zero drift typ. 0.02%/°C, Span typ. 0.005%/°C
Ambient temperature	0 to 70°C, (95% humidity, max. non-condensing)

PT100 Version		Thermocouple Versions (J, K, T)
Input	to DIN 43760 100R @ 0°C (2 or 3 wire)	Insulated junction J K or T sensor
Accuracy	±0.2°C and +0.2% rdg.	±0.1% FS and cold junction errors
Offset adjustment	range dependant	±100°C, solder link & potentiometer
Gain/adjustment	25°C to 500°C	100 to 1000°C
Impedance		>1MΩ
Burn out	Up scale standard (downscale option)	
Cold junction	Automation 0 to 70°C ±0.2%	
Temperature range	-30°C to +400°C	J=0 to +400°C, K=0 to +1000°C, T=0 to +400°C

229914

Sensor Type	Mfrs. List No.	Order Code	1+	5+	10+	25+
PT100	SEM104PT100	615-675	39.09	37.14	35.29	33.53
Thermocouple	SEM104TC	615-687	45.62	43.34	41.18	39.12



Thermocouple Connectors and Accessories - continued

Temperature Transmitter - Low Profile 4 - 20mA, 2 wire loop Output



- Low profile 23mm height
- Wide range of span adjustment
- Minimal interaction span and zero potentiometer action
- In-head mounting with DIN standard fixing
- Input noise rejection
- Pt100 or thermocouple types J and K
- CE compliant

New

520063

Input Type Temperature Range	Mfrs. List No.	Order Code	1+	Price Each 10+	25+
Pt100 - IEC 751, 3 Wire 0 to 100°C 0 to 200°C	SI-060	163-3463 ●	45.32	43.05	40.79
	SI-061	163-3464 ●	45.32	43.05	40.79
Thermocouple to IEC 584 J Type - 0 to 300°C K Type - 0 to 200°C K Type - 0 to 1100°C	SI-062	163-3465 ●	53.56	50.88	48.20
	SI-063	163-3467 ●	53.56	50.88	48.20
	SI-064	163-3468 ●	53.56	50.88	48.20

Temperature Transmitter 4 - 20mA, 2 wire loop Output



- Wide range of span adjustment
- Minimal interaction span and zero potentiometer action
- In-head mounting with DIN standard fixing
- Input noise rejection
- Pt100 or thermocouple types J and K
- CE compliant

New

520050

Input Type Temperature Range	Mfrs. List No.	Order Code	1+	Price Each 10+	25+
Pt100 - IEC 751, 3 Wire 0 to 100°C 0 to 200°C	SI-050	163-3458 ●	47.38	45.01	42.64
	SI-051	163-3459 ●	47.38	45.01	42.64
Thermocouple to IEC 584 J Type - 0 to 300°C K Type - 0 to 200°C K Type - 0 to 1100°C	SI-052	163-3460 ●	57.68	54.80	51.91
	SI-053	163-3461 ●	57.68	54.80	51.91
	SI-054	163-3462 ●	57.68	54.80	51.91

Temperature Transmitters Push Button Calibration



H = 21, Dia. = 43mm

A simple push button operation selects the range and calibrates the SEM203 4 - 20mA temperature transmitter, eliminating the need for soldering links, potentiometers or PC's. The devices connect to an appropriate sensor and convert the output to a linear 4 - 20mA output signal. The SEM203 is linearised to comply with all common RTD sensor standards, all common thermocouple types and up to 10kR potentiometers.

- Push button calibration
- Re-rangeable without a PC
- Drift free linearisation
- LED over-range indication

Specifications

Approvals
Operating temperature
Lead Length (Max.)
Accuracy
Loop Drop

EMC Emissions to BS EN 61326
-20 to 80°C
3m
±0.01% full scale
<4.0V @ 20 mA

Input - Sensor & Range

8840172
Pt100 - -200 to +850°C
8840180
K - 200 to 1370°C
J - 200 to 1200°C
T - 200 to 400°C

Default Range
Input
Default Range

<4.0V @ 20 mA
±0.01% full scale
<4.0V @ 20 mA

386395

Input	Mfrs. List No.	Order Code	1+	Price Each 5+	10+	25+
3 wire, Pt100	SEM203/P	884-0172	32.67	31.04	29.48	28.00
K, J or T (Selectable)	SEM203/TC	884-0180	42.31	40.19	38.18	36.28

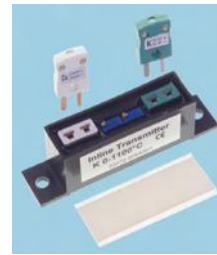
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Please recycle after use.

Temperature Transmitter - In-Line 4 - 20mA, 2 wire loop Output

LABFACILITY
TEMPERATURE TECHNOLOGY



- 4 - 20mA, 2 wire loop output
- In-head mounting with DIN standard fixing
- Input and output plugs included
- Free standing or surface mount, fixing lugs and adhesive patch included
- CE compliant

New

H = 28.8, W = 92, D = 20mm

These products provide a rapid and simple solution to convert to, or add 4-20mA loops using existing sensors in-situ without process downtime. The device can be used as a free-mounted unit or can be surface mounted via integral fixing lugs. Connections to it are made using miniature connectors which are polarized to prevent cross-connection and colour coded to suit the sensor types. Key features of the transmitter are the minimal-interaction span and zero calibration potentiometer and an exceptionally wide range of adjustment is provided by the potentiometers to allow for easy re-calibration of the 4-20mA temperature range. The compact, lightweight, potted module houses an accurate, stable, measurement circuit which incorporates automatic cold junction compensation for thermocouple inputs. It is designed to be connected to the extension cable which exits the temperature probe so particular attention has been paid to eliminating the effects of possible noise pick-up at the input.

520122

Input Type Temperature Range	Mfrs. List No.	Order Code	1+	Price Each 10+	25+
Pt100 - IEC 751 -50 to 450°C	SI-070	163-3473 ●	70.04	66.54	63.04
Thermocouple to IEC 584 J Type 0 to 450°C K Type 0 to 1100°C N Type 0 to 1300°C	SI-071	163-3474 ●	70.04	66.54	63.04
	SI-072	163-3475 ●	70.04	66.54	63.04
	SI-073	163-3476 ●	70.04	66.54	63.04

PT100, Thermocouple, mV & Slidewire to 4-20mA Smart Converter



- Accept temperature sensor, slidewire or mV signal and convert the output to 4-20mA
- Sensor type and range can easily be programmed by windows based software or DIP switches at the back of the unit
- Galvanically isolated
- CE marked
- Can be mounted on 35mm top hat DIN rail

5
WARRANTY
YEARS

H=99.5, W=18.25, D=90

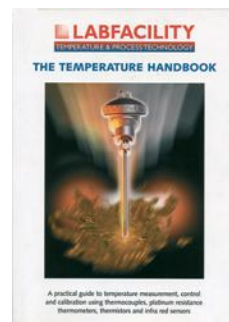
Output
Loop supply
Input
4-20mA(loop powered)
10-35Vdc (reverse polarity protected)
PT100: -200 to +850°C (18-390ohms) Thermocouple: J,K,T,R,S,E,F & N, mV:-10 TO 75mV
EN50081-1, EN50082-2
-40°C to 85°C
Windows based, 3.1 95 NT
Kit content: PSU, configurator, software disk all supplied in compact case

204850

	Mfrs. List No.	Order Code	1+	Price Each 5+	10+	25+
Converter	SEM215	161-834	101.21	98.18	95.24	92.38
Programming Kit	RCPW	161-846	164.70	159.76	154.96	150.32

NEW Temperature Handbook

LABFACILITY
TEMPERATURE TECHNOLOGY



- Explains current changes in temperature technology
- Covers temperature measurement using electrical techniques
- Thermocouple and resistance thermometer theory and practice
- Reference tables and glossary of terms

386229

Mfrs. List No.	Order Code	1+	3+
IL-001	859-8088●	8.04	7.05

Platinum Resistance Sensors

Platinum Resistance Thermometry

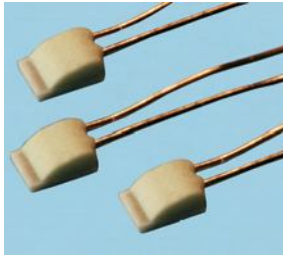
The platinum sensing resistor, Pt100 to IEC 751, is dominant in Europe and in many other parts of the world. Its advantages include chemical stability, relative ease of manufacture, the availability of wire in a highly pure form and excellent reproducibility of its electrical characteristic. The result is a truly interchangeable sensing resistor which is widely commercially available at a reasonable cost.

Source: LABFACILITY TEMPERATURE HANDBOOK - Part No. 656-069

224663

Platinum Thin Film Sensors

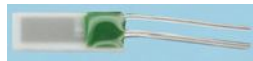
PT Series



161



232



520

Dimensions (mm)			Lead Length	Case Style
W	H	D		
1.2	1.6	0.65	10mm	161
2	2.3	0.65	10mm	232
2	5	0.65	10mm	520
1.5	3	0.65	N/A	1206
1.2	2	0.65	N/A	0805
Measuring Range	Resistance	Operating Temperature	Mfrs. List No.	Order Code
PT100 Series				
Up to 600°C	100Ω	-200 to 850°C	P0K1.161.6W.B.010	126-6922
Up to 600°C	100Ω	-90 to 300°C	P0K1.161.6W.A.010	126-6923
Up to 600°C	100Ω	-50 to 150°C	P0K1.161.6W.Y.010	126-6924
Up to 600°C	100Ω	-200 to 850°C	P0K1.232.6W.B.010	126-6926
Up to 600°C	100Ω	-90 to 300°C	P0K1.232.6W.A.010	126-6927
Up to 600°C	100Ω	-50 to 150°C	P0K1.232.6W.Y.010	126-6928
Up to 600°C	100Ω	-200 to 850°C	P0K1.520.6W.B.010	126-6929
Up to 600°C	100Ω	-90 to 300°C	P0K1.520.6W.A.010	126-6930
Up to 600°C	100Ω	-50 to 150°C	P0K1.520.6W.Y.010	126-6931
Up to 200°C	100Ω	-200 to 850°C	P0K1.1206.2P.B	126-6932
Up to 200°C	100Ω	-90 to 300°C	P0K1.1206.2P.A	126-6933
Up to 200°C	100Ω	-200 to 850°C	P0K1.0805.2P.B	126-6934
Up to 200°C	100Ω	-90 to 300°C	P0K1.0805.2P.A	126-6935
PT1000 Series				
Up to 600°C	1000Ω	-200 to 850°C	P1K0.161.6W.B.010	126-6936
Up to 600°C	1000Ω	-90 to 300°C	P1K0.161.6W.A.010	126-6938
Up to 600°C	1000Ω	-50 to 150°C	P1K0.161.6W.Y.010	126-6939
Up to 600°C	1000Ω	-200 to 850°C	P1K0.232.6W.B.010	126-6940
Up to 600°C	1000Ω	-90 to 300°C	P1K0.232.6W.A.010	126-6941
Up to 600°C	1000Ω	-50 to 150°C	P1K0.232.6W.Y.010	126-6942
Up to 600°C	1000Ω	-200 to 850°C	P1K0.520.6W.B.010	126-6943
Up to 600°C	1000Ω	-90 to 300°C	P1K0.520.6W.A.010	126-6944
Up to 600°C	1000Ω	-50 to 150°C	P1K0.520.6W.Y.010	126-6945
Up to 200°C	1000Ω	-200 to 850°C	P1K0.1206.2P.B	126-6946
Up to 200°C	1000Ω	-90 to 300°C	P1K0.1206.2P.A	126-6947
Up to 200°C	1000Ω	-200 to 850°C	P1K0.0805.2P.B	126-6948
Up to 200°C	1000Ω	-90 to 300°C	P1K0.0805.2P.A	126-6949

453899

Mfrs. List No.	Order Code	1+	10+	25+
PT100 Series				
P0K1.161.6W.B.010	126-6922●	12.53	11.38	10.45
P0K1.161.6W.A.010	126-6923●	15.04	13.67	12.53
P0K1.161.6W.Y.010	126-6924●	18.79	17.09	15.66
P0K1.232.6W.B.010	126-6926●	4.84	4.40	4.04
P0K1.232.6W.A.010	126-6927●	5.81	5.27	4.85
P0K1.232.6W.Y.010	126-6928●	7.26	6.60	6.05
P0K1.520.6W.B.010	126-6929●	9.10	8.27	7.59
P0K1.520.6W.A.010	126-6930●	9.87	8.99	8.23
P0K1.520.6W.Y.010	126-6931●	9.90	9.00	8.25
P0K1.1206.2P.B	SMD 126-6932●	11.76	10.69	9.80
P0K1.1206.2P.A	SMD 126-6933●	14.64	13.30	12.19
P0K1.0805.2P.B	SMD 126-6934●	19.93	18.13	16.62
P0K1.0805.2P.A	SMD 126-6935●	14.54	13.23	12.11
PT1000 Series				
P1K0.161.6W.B.010	126-6936●	12.53	11.38	10.45
P1K0.161.6W.A.010	126-6938●	15.04	13.67	12.53
P1K0.161.6W.Y.010	126-6939●	18.79	17.09	15.66
P1K0.232.6W.B.010	126-6940●	5.68	5.16	4.74
P1K0.232.6W.A.010	126-6941●	5.81	5.27	4.85
P1K0.232.6W.Y.010	126-6942●	7.26	6.60	6.05
P1K0.520.6W.B.010	126-6943●	9.10	8.27	7.59
P1K0.520.6W.A.010	126-6944●	9.87	8.99	8.23
P1K0.520.6W.Y.010	126-6945●	15.47	14.07	12.89
P1K0.1206.2P.B	SMD 126-6946●	11.76	10.69	9.80
P1K0.1206.2P.A	SMD 126-6947●	14.64	13.30	12.19
P1K0.0805.2P.B	SMD 126-6948●	19.93	18.13	16.62
P1K0.0805.2P.A	SMD 126-6949●	22.81	20.74	19.00

PT100 Elements



L=25, Dia=2.8, Lead L=8.0

L=25.4, W=3.2, Thickness=0.8, Lead L=8.0

- Meets requirements of **BS1904 Class B** and **DIN43760**
- Suitable for air and gas temperature measurement
- Cylindrical wire-wound element also particularly suitable for use within protective stainless steel tubular sheath
- Flat element features thick film technology giving particularly good vibration resistance and long term stability

	Cylindrical (541-102)	Thin-film (721-8850)
Temperature range	-200°C to +800°C	-50°C to +500°C
Ice point resistance	100±0.12Ω	100±0.12Ω
Fundamental interval (0°C to 100°C)	38.5Ω (nominal)	38.5Ω (nominal)
Self heating	<0.03°C/mW	Use <2mA excitation
Thermal response	0.4s	0.3s
Stability	±0.05%	±0.06%

Mfrs. List Nos.

P100/2528 = 541-102, DM503 (5) = 721-8850

FOR SUITABLE EXTENSION CABLE (SILVER PLATED COPPER CONDUCTOR),
SEE **ORDER CODE 277-095**

222135

	Order Code	1+	Price Each	25+
Cylindrical element	541-102●	11.24	10.32	9.78
Thin film element			Price Per Pack	
(Pack of 5)	721-8850●	17.92	17.04	16.21

PT100 Elements with Extension Wires



High quality PT100 sensing resistor of wire-wound construction fitted with extension wires for convenient application.

- PT100 sensing element to **IEC 751 Class B**
- PTFE insulated stranded tails, 2 or 4 wire configuration
- For use from -60°C to +250°C

725-5731: L=35, Dia.=5, 2 leads L=50

725-5743: L=35, Dia.=5, 4 leads L=450

212375

	Mfr. List No.	Order Code	1+	5+	10+	25+
2-wire	010011TD	725-5731●	14.06	13.08	12.43	11.33
4-wire	010010TD	725-5743●	16.28	15.16	14.40	13.12

Pt100 & Pt1000 Elements

Thin Film (100 Ohms)



- Pt100 & Pt1000 elements to IEC 751 Class A & B
- Thin Film construction

- Suitable for surface & immersion applications where protected
- Operating temperature -70°C to +600°C
- Vibration resistant

Sensor Type	Pt100 (100 Ohms @ 0°C)	Pt1000 (1000 Ohms @ 0°C)
Construction	Thin film, 10mm tails	Thin film, 10mm tails
Temperature Range	-50 to 550°	-50 to 550°
Ice point resistance	100 Ω	1000 Ω
Fundamental interval (0°C to 100°C)	38.5 Ω (nominal)	385 Ω (nominal)
Self heating	<0.05°C/mW	<0.5°C/mW
Thermal response	0.1s	0.1s
Stability	± 0.05%	± 0.05%

386236/406078

Description	Mfrs. List No.	Order Code	1+	5+	10+	25+
Pt100 Elements						
1.2 x 1.6mm, Class A	DM-314	128-9670●	5.26	4.78	4.38	--
1.2 x 1.6mm, Class B	DM-315	128-9671●	4.19	3.80	3.50	--
1.2 x 4.0mm, Class A	DM-312	128-9668●	5.26	4.78	4.38	--
1.2 x 4.0mm, Class B	DM-313	128-9669●	4.19	3.80	3.50	--
2 x 2.3mm, Class A	DM-303	128-9667●	4.03	3.66	3.35	--
2 x 2.3mm, Class B	DM-301	859-8541●	2.85	2.57	2.36	2.14
2 x 5.0mm, Class A	DM-508	128-9666●	3.64	3.30	3.03	--
2 x 10mm, Class A	DM-334	859-8525●	6.04	5.34	4.81	4.35
2 x 10mm, Class B	DM-333	859-8533●	4.14	3.71	3.40	3.08
Pt1000 Elements						
2 x 10mm, Class A	DM-310	859-8550●	5.34	4.82	4.42	4.07
2 x 10mm, Class B	DM-507	774-5655●	3.26	2.95	2.68	2.37
Pt100 PCB Surface Mount with Solder Pads						
1.6 x 3.2mm, Class B	DM-317	128-9672●	2.57	2.33	2.08	--

Over 480,000 products online



Platinum Resistance Sensors - continued

PT100 Patch Sensor



L = 40
W = 13
Thickness = 5

- PT100 sensor to **BS1904 Class B**, mounted on the reverse side of self-adhesive foil
- Rugged sensor encapsulated within a waterproof silicone rubber
- 4 wire connection
- PTFE insulated, twisted pair lead, 4 core, 7/0.2mm
- Temperature range -50 to 150°C
- High accuracy PT100 surface temperature measurement
- Good resistance to many oils and chemicals

212150

Mfrs. List No.	Order Code	1+	10+	25+
RTF4-2/NAH (2m lead)	254-678●	37.74	36.10	33.97
RTF4-3 (3m lead)	NEW 163-3500●	41.20	39.55	37.90

PT100 Probe



Probe L = 117, Dia. = 4, Overall length = 146, Bush thread = " BSP, Lead L = 1m

- Multi-purpose fast response 2-wire platinum resistance probe
- Manufactured from seamless stainless steel tube
- Tube is fitted with a 1/8" BSP compression fitting moveable over its entire length to allow flexibility in siting the probe
- Excellent stability and resistance to vibration and shock
- Sensor meets requirements of **BS1904 Class B**

Temperature range -70°C to +200°C Thermal response 1.2s typical
Ice point resistance 100±0.1Ω

212164

Order Code	1+	10+	25+
146-885●	32.79	29.67	28.12

General Purpose Temperature Sensor

PT 100

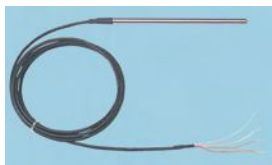


- Heavy duty, industrial probe
- Tough, silicone rubber insulated lead-out
- Class B, 4 wire
- 6mm diameter stainless steel rigid sheath
- 4 core 7/0.2mm silicone rubber insulated lead
- Sensor temperature range -50°C to +200°C

386232/406080

Description	Mfrs. List No.	Order Code	1+	5+	10+	25+
50mm probe - 2m lead	DRG 010632A	859-8096●	35.21	31.89	29.29	26.04
100mm probe - 2m lead	DRG 010632B	859-8100●	39.90	36.14	33.20	29.50
50mm probe - 4m lead	DRG101632C	NEW 163-3501●	46.35	44.50	42.64	38.93
100mm probe - 4m lead	DRG101632D	NEW 163-3502●	52.79	50.68	48.57	44.34

PT100 Probe, PTFE Insulated



- Rigid, 6mm diameter, multi-purpose stainless steel probe
- Temperature measuring range up to 250°C
- Recommended where the superior accuracy of a PT100 sensor over a thermocouple is required
- Fitted with a PTFE lead
- Suitable for connection to any PT100 instrument - 2, 3 or 4 wire

Sensor PT100, 4 wire to **BS1904 (1984) Class B** and **DIN 43760** 100Ω @ 0°C
Temperature range -50°C to +250°C

FOR SUITABLE COMPRESSION GLAND, ORDER CODE 254-654

222144

Dimensions	Mfrs.					
Probe Length	Probe Dia.	List No.	Order Code	1+	10+	100+
1m Lead length						
150mm	6mm	PT46X150	560-170●	33.44	31.37	29.41
250mm	6mm	PTE 6X250 (IEC)	708-8358●	34.98	33.83	32.27
150mm	3mm	XF-314-FAR	410-0670●	30.47	28.93	28.17
250mm	3mm	XF-315-FAR	410-0682●	31.82	30.22	29.41
2m Lead length						
150mm	6mm	PT4 6 X150	NEW 163-3503●	38.63	37.08	35.54
150mm	3mm	PT4 3 X150	NEW 163-3504●	41.20	39.55	37.90
250mm	3mm	PT4 3 X250	NEW 163-3505●	42.75	41.04	39.33

Mineral Insulated PT100 Probes



- Mineral Insulated PT100, Class B, 4 Wire
- Flexible sheath
- Can withstand up to 500°C
- 310SS sheath material
- 1000mm PTFE 4 core screened cable

249385

Probe Dia. (mm)	Probe L (mm)	Order Code	1+	5+	10+
3	150	410-0694●	54.18	51.48	50.09
6	150	410-0712●	57.45	54.57	53.12
6	250	410-0724●	61.00	57.95	56.39

Precision PT100 Probe



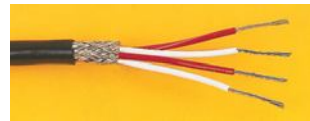
- High accuracy 6mm diameter stainless steel PT100 probe
- Ideal for use as temperature reference for comparison calibration of other temperature sensors, and for other high accuracy applications
- Accuracy better than ±0.06°C at 0°C and suitable for use up to 250°C

Dimensions Dia = 6, Probe L = 250, Lead L = 2m
Sensor PT100, 4 wire to **BS1904 (1984)**
Accuracy Better than ±0.06°C @ 0°C
Temperature range -50°C to +250°C
Insertion length 150mm, minimum recommended

212320

	Mfrs. List No.	Order Code	1+	5+	10+
Precision PT100 Probe	L250	721-8758●	70.20	66.69	63.46

Screened Extension Cable - Type PRT



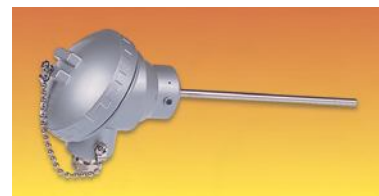
- Suitable for joining 2, 3 or 4-wire PT100 and other PRT sensors to instrumentation
- Colour coded to industry standard **IEC751** (red, red, white, white)
- For use up to 80°C

Flexible 4-wire extension cable comprising 4 PVC-insulated copper conductors size 7/0.2mm, with electrical screen and overall PVC sheath. Nominal O/D = 4mm.

212319

	Mfrs. List No.	Order Code	1+	5+	10+
PRT cable, 10m coil	WC-006/10M	721-8734●	14.86	14.12	13.46
PRT cable, 25m coil	WC-006/25M	721-8746●	34.59	32.87	31.28

Industrial Probes with Terminal Head



- Strong 6mm diameter stainless steel stem
- Waterproof aluminium terminal head
- **IP67** protection
- Suitable for connection to any PT100 instrument - 2, 3 or 4 wire

The head of the probe contains a terminal block allowing connection to the measuring instrument via a M20 gland.

Sensor PT100, 4 wire to **BS1904 (1984) Class B** and **DIN 43760** 100Ω @ 0°C
Temperature head Die cast aluminium, epoxy coated, Screwed lid with retaining chain
Temperature range **IP67** rated
-50°C to +450°C
Mfr. List Nos. PT4 6 x 150 = 560-157, PT4 6 x 300-KNE = 560-169
PT4 6 x 400 = 708-8449

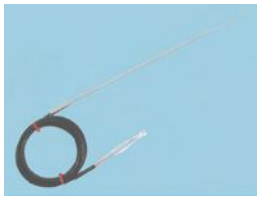
FOR SUITABLE COMPRESSION GLAND SEE ORDER CODE 254-654

222145

Probe Length	Order Code	1+	5+	10+
150mm	560-157●	53.96	51.32	48.85
300mm	560-169●	55.08	52.35	49.83
400mm	708-8449●	55.76	52.98	50.44

Thermocouple Probe with Extension Lead

Pt100 Sensor - Swaged Tip



- Quick thermal response
- Rugged construction
- Suit flowing fluids, H & V applications, process plant
- 200 x 3mm swaged down to 50 x 2mm and 200 x 6.35mm swaged down to 50 x 3mm, stainless steel probes
- Pt100 sensor
- 2 m PFA extension lead



New

519889

Probe Length	Mfrs. List No.	Order Code	1+	10+	25+
200mm	011046TD	163-3446●	88.00	83.61	79.21
200mm	011047TD	163-3447●	80.28	76.26	72.26

Industrial Process Probes



Probes: Dia.=6, L=100, 150, 200
Mounting: 1/2" BSPP male thread

Lagging extension:
Dia.=12.7, L=75

- Accurate rugged construction
- Pt100 sensor to **IEC 751 Class B**
- Terminal head can accommodate DIN form transmitter or DIN terminal block
- Wide temperature range: -100°C to +450°C
- For use with 4, 3 or 2 wire instruments
- All stainless steel below aluminium head
- DIN terminal block is made of high temperature white plastic and has 4 terminals
- Suitable for many industrial applications
- **IP67** rated

This industrial Pt100 assembly is mounted into the process via 1/2" BSPP male thread below which the probe length is measured. Above the thread hexagon is a stainless steel lagging extension. The sensor has a fitted aluminium terminal head with a captive threaded cover.

FOR SUITABLE Pt100 4 - 20MA TRANSMITTER, SEE **ORDER CODE 615-675**

222175

Probe Length	Mfrs. List No.	Order Code	1+	5+	10+
100mm	010007TD	725-5421●	61.96	57.62	54.81
150mm	010008TD	725-5433●	64.77	60.26	57.28
200mm	010009TD	725-5445●	67.60	62.87	59.78
Terminal Block	HT-054	725-5457●	5.86	5.45	5.19

Thermocouple Probe

Pt100, 4 Wire Sensor - Swaged Tip



- Quick thermal response
- Rugged construction
- Industrial process construction to IP67, KNE head
- 300 x 6.35mm stainless steel probe swaged down to 50 x 3mm
- M20 cable gland



New

519886

Probe Length	Mfrs. List No.	Order Code	1+	10+	25+
300mm	011048TD	163-3444●	85.20	80.94	76.68

External/Cold Store PT100 Probe



- Rugged wall-mounting stainless steel probe with weatherproof connection box
- Recommended for outdoor use, cold stores and other 'heavy-duty' applications
- PT100 sensor suitable for connection to 2, 3 or 4 wire PT100 instrument
- Perforated outer stainless steel sheath acts as radiated heat shield and mechanical protection

Sensor PT100 4-wire to **BS1904 (1984), Class B**

Temperature range -50°C to +150°C

IP rating **IP67**

Case H=80, W=74, D=54; Probe L=75, Dia=12.5

212321

Mfrs. List No.	Order Code	1+	5+	10+
RTP-PT100	721-8760●	89.00	82.81	78.71

Clean Room Pt100 Assembly



- Wall mounting Pt100 sensor, mounts on standard electrical conduit
- Pt100 to **IEC 751 Class B**
- Suitable for use with any 2, 3 or 4 wire instrument
- Flame retardant vented moulded case

H=85, W=85, D=30

212383

Mfrs. List No.	Order Code	1+	5+	10+
010014TD	725-5720●	29.24	27.18	25.84

Thermal Switches

Bi-Metallic, Auto Reset



Style A
H=21 (overall), W=31, D=19
Fixing centres = 24 (holes M3)

Style B
H=16 (overall), W=30, D=17
Fixing centres = 24 (hole dia 3.7)

- Automatically re-setting thermal switches with snap action bi-metallic SPST contacts
- Contacts are isolated from the mounting base
- Reset level is specified to within a close tolerance band
- All types are **UL** and **VDE** approved. Style A types also **CSA** approved
- Indication of switch temperature is given on base of switch

Normally closed (opening on temperature rise) and normally open (closing on temperature rise) types are available. All the switches reset when the temperature falls to the reset level. Connection is by 1/4" (6.3 x 0.8mm) terminals.

Contact rating (all types) 10A 250V ac, 15A 125Vac (100,000 cycles)
Body material Phenolic (style A), Thermoplastic (style B)
Base material Aluminium
Mounting flange material Stainless steel (style A), aluminium (style B)

Normally Closed Types	Opening Temp.	Reclosing Temp.	Style	Mfrs. List No.	Order Code
15°C ± 3°C	5°C ± 4°C	A	A	A 15 03EN 175	732-400
20°C ± 3°C	10°C ± 3°C	A	A	03EN15T044(20/10)	732-412
30°C ± 3°C	20°C ± 3°C	A	A	03EN15T044(30/20)	606-686
40°C ± 3°C	25°C ± 4°C	A	A	03EN15T044(40/25)	491-445
50°C ± 3°C	35°C ± 4°C	B	B	T23A050ASR2-15	100-6842
70°C ± 3°C	55°C ± 4°C	B	B	T23A070ASR2-15	100-6843
90°C ± 3°C	70°C ± 4°C	B	B	T23A090ASR2-20	100-6844
100°C ± 3°C	85°C ± 4°C	B	B	T23A100ASR2-15	100-6845
112°C ± 3°C	97°C ± 4°C	B	B	T23A112ASR2-15	100-6846
125°C ± 3°C	110°C ± 4°C	B	B	T23A125BSR2-15	100-6847
150°C ± 3°C	135°C ± 4°C	B	B	T23A150BSR2-15	100-6849
Normally Open Types	Closing Temp.	Reopening Temp.	Style	Mfrs. List No.	Order Code
30°C ± 4°C	20°C ± 5°C	A	A	03EN35T044(20/30)	732-424
40°C ± 3°C	25°C ± 4°C	A	A	03EN35T044(25/40)	491-524
50°C ± 3°C	35°C ± 4°C	A	A	T23B050ASR2-15	100-6851
60°C ± 3°C	45°C ± 4°C	A	A	T23B060ASR2-15	100-6852
70°C ± 3°C	55°C ± 4°C	A	A	T23B070ASR2-15	100-6853
90°C ± 3°C	70°C ± 4°C	A	A	T23B090ASR2-20	100-6854

341074/212166

Type	Order Code	1+	50+	100+	250+	1K+
Normally Closed Types						
15°C N/C	732-400	2.71	2.48	2.09	1.84	1.64
20°C N/C	732-412	2.71	2.48	2.09	1.84	1.64
30°C N/C	606-686	2.71	2.48	2.09	1.84	1.64
40°C N/C	491-445	2.22	2.00	1.62	1.43	1.31
50°C N/C	100-6842●	2.14	1.95	1.55	1.38	1.13
70°C N/C	100-6843●	2.14	1.95	1.55	1.38	1.13
90°C N/C	100-6844●	2.14	1.95	1.55	1.38	1.13
100°C N/C	100-6845●	2.14	1.95	1.55	1.38	1.13
112°C N/C	100-6846●	2.14	1.95	1.55	1.38	1.13
125°C N/C	100-6847●	2.14	1.95	1.55	1.38	1.13
150°C N/C	100-6849●	2.14	1.95	1.55	1.38	1.13
Normally Open Types						
30°C N/O	732-424	2.40	2.11	1.72	1.50	1.36
25°C N/O	491-524	2.40	2.11	1.72	1.50	1.36
35°C N/O	100-6851●	2.14	1.95	1.55	1.38	1.13
60°C N/O	100-6852●	2.14	1.95	1.55	1.38	1.13
70°C N/O	100-6853●	2.14	1.95	1.55	1.38	1.13
90°C N/O	100-6854●	2.14	1.95	1.55	1.38	1.13



Thermal Switches - continued

Bi-Metallic, Auto Reset,
High Temperature

MICROTHERM



H=21 (overall), W=31, D=19
Fixing centres = 24 (holes M3)

- Automatically re-setting thermal switches with snap-action bi-metallic SPST contacts
- Contacts are normally closed, and are isolated from the mounting base
- Range of switching temperatures from 170°C to 250°C
- Indication of switch temperature is given on base of switch

Contact rating (all types) 10A 250V ac, 15A 125Vac (100,000 cycles) (UL/CSA)
Connections 6.3 x 0.8 (4") spade terminals

Opening Temp.	Reclosing Temp.	Body Material	Mfrs List No.	Order Code
170°C ± 5°C	140°C ± 10°C	Ryton	21EN15T044(170/150)	732-436
200°C ± 10°C	160°C ± 10°C	Ceramic	52N12T944(200/160)	732-450
225°C ± 10°C	175°C ± 10°C	Ceramic	52N12T044(225/175)	732-461
250°C ± 10°C	200°C ± 10°C	Ceramic	55H12T944(250/200)	732-473

212351

Type	Body	Order Code	1+	25+	100+	250+
170°C N/C	Ryton	732-436	2.71	2.48	2.12	1.95
200°C N/C	Ceramic	732-450	2.88	2.60	2.47	2.28
225°C N/C	Ceramic	732-461	2.88	2.60	2.47	2.28
250°C N/C	Ceramic	732-473	3.55	3.24	3.07	2.81

Bi-Metallic, Manual Reset

MICROTHERM



- Snap-action bi-metallic SPST contacts are isolated from the mounting base
- Horizontal tab connections allow easy access to reset pin
- UL Recognised and CSA approved

The switches are normally closed and open on temperature rise, then remain open until manually reset. Connection is by 6.3 x 0.8 (4") spade terminals.

Contact rating (UL, CSA) 10A 250Vac (10,000 cycles), 15A 120Vac (6,000 cycles)
Contact material Silver alloy

Operating Temp.	Mfrs. List No.	Order Code	90°C ±5°C	05EN1034(90/M)	732-552
45°C ±4°C	05EN1034(45/M)	732-515	100°C ±4°C	05EN1034(100/M)	732-564
55°C ±4°C	05N1034(55/M)	732-527	115°C ±5°C	05EN1034(115/M)	732-576
65°C ±4°C	05EN1034(65/M)	732-539	130°C ±5°C	05EN1034(130/M)	732-588
80°C ±5°C	05EN1034(80/M)	732-540	150°C ±5°C	05EN1034(150/M)	732-590

212352

Order Code	1+	10+	25+	100+	250+
All Order Codes	2.56	2.45	2.40	2.32	2.11

Solid State

MICROTHERM



Style B3 Style C3

Solid state MOXIE® thermal sensors are effectively NTC thermistors with a highly specific transition region. When heated, the sensor has a high resistance until the transition temperature is reached, at which temperature the resistance falls rapidly from about 100KΩ to about 100Ω for approximately a 10°C change. The reverse characteristic is followed on cooling, with little hysteresis.

Lead L=12.7
Lead spacing=2.54 Hole dia=3.5

Mounting tab style B3 L=14, W=6.5, H=4.2
Mounting tab style C3 L=5.5, W=6.5, H=1.4

- Very specific transition region
- High sensitivity and reliability
- Low noise and low shunt capacitance
- TO-18 housing with choice of mounting tab style

Transition Temp (centre)	Mfrs. List No.	Order Code	C3 Mtg. Tab	B3 Mtg. Tab	C3 Mtg. Tab
57°C	TS3-57-B3	151-597	151-597	151-600	151-600
75°C	TS3-75-B3	151-598	151-598	151-601	151-601
85°C	TS3-85-B3	151-599	151-599	151-602	151-602

212188

Transition Temp.	Order Code	1+	25+	100+	250+
B3 Mounting Tab					
57°C	151-597	2.94	2.77	2.55	2.40
75°C	151-598	2.94	2.77	2.55	2.40
85°C	151-599	3.40	3.08	2.56	2.35
57°C	151-600	3.47	3.14	2.61	2.40
75°C	151-601	3.47	3.14	2.61	2.40
85°C	151-602	3.47	3.14	2.61	2.40

Bi-Metallic, Manual Reset

MICROTHERM



- Snap-action bi-metallic SPST contacts are isolated from mounting base
- Approvals include VDE, DEMKO, UTE, KEMA and EIL
- UL Recognised

The switches are normally closed and open on temperature rise, then remain open until manually reset. Connection is by 1/4" (6.3 x 0.8mm) terminals.

Opening Temp.	Mfrs. List No.	Order Code	Opening Temp.	Mfrs. List No.	Order Code
45°C ± 3°C	R32-C159	606-698	100°C ± 3°C	R32-C184	254-022
56°C ± 3°C	R32-C166	253-996	112°C ± 3.4°C	R32-C187	606-704
67°C ± 3°C	R32-C171	254-009	132°C ± 4°C	R32-C192	254-034
80°C ± 3°C	R32-C177	254-010	150°C ± 4.5°C	R32-C195	606-716
90°C ± 3°C	R32-C180	732-497			

Contact rating 16A @ 250V Contact material Fine Silver

H=24.5, W=36.2 (across terminals), W=30.4 (across flange),
D=18.2, Fixing centres=23.8 (hole dia. 3.7)

212151

Order Code	1+	10+	25+	100+
All Order Codes	6.64	6.00	5.69	5.21

2455R Series Theromstats

Honeywell

B203S Mounting Bracket and T146 Terminals



- Open on rising temperature and close on rising temperature versions available
- Standard mounting bracket: B203S
- Horizontal T146 terminals
- Operating temperatures in 10°C steps
- Up to 15A and up to 250V ac
- Silver contact system

419439/436284

			Price Each				
Temperature (°C)	Mfrs. List No.	Order Code	1+	10+	25+	100+	
Normally Closed - Open on rising temperature Contacts							
Opening	Closing						
30	15	2455R-100-84	108-2187●	1.60	1.29	1.18	1.08
40	25	2455R-100-72	108-2189●	1.60	1.29	1.18	1.08
50	35	2455R-100-73	108-2191●	1.60	1.29	1.18	1.08
60	45	2455R-100-85	108-2192●	1.60	1.29	1.18	1.08
70	55	2455R-100-74	108-2193●	1.60	1.29	1.18	1.08
80	65	2455R-100-75	108-2194●	1.60	1.29	1.18	1.08
90	75	2455R-100-76	108-2195●	1.60	1.29	1.18	1.08
100	80	2455R-100-77	108-2196●	1.60	1.29	1.18	1.08
110	90	2455R-100-86	108-2197●	1.60	1.29	1.18	1.08
120	98	2455R-100-98	108-2198●	1.60	1.48	1.44	1.41
130	110	2455R-100-88	108-2199●	1.60	1.29	1.18	1.08
140	115	2455R-100-89	108-2200●	1.60	1.29	1.18	1.08
150	120	2455RC-9100-373	108-2201●	2.00	1.95	1.90	1.85
Normally Open - Close on rising temperature Contacts							
Closing	Opening						
50	35	2455R-100-78	108-2202●	2.00	1.95	1.90	1.85
60	45	2455R-100-79	108-2203●	2.00	1.95	1.90	1.85
80	65	2455R-100-92	108-2204●	1.60	1.29	1.18	1.08
90	75	2455R-100-93	108-2205●	1.60	1.29	1.18	1.08
100	80	2455R-100-94	108-2207●	1.60	1.29	1.18	1.08
120	100	2455R-100-95	108-2208●	1.60	1.29	1.18	1.08
140	115	2455R-100-96	108-2209●	1.60	1.29	1.18	1.08

Bi-Metallic, Dual in Line Package

AIRPAX



H = 3.30mm, W = 10.16mm, D = 6.35mm

- Automatically resetting thermal switches with snap-action bi-metallic SPST contacts
- Available normally open or normally closed
- Suitable for printed circuit boards and suitable for auto-insertion.
- UL recognised, CSA certified
- Sealed to withstand wave soldering and board washing operations

Contact rating 1A @ 48V dc, 120V ac, (30000 cycles) (down to) @ (100000 cycles)
Contact material Gold plated Silver cross bar
Pin spacing 7.5mm x 8.25mm

Normally Closed Types

Opening Temp. (±5°C)	Reclosing Temp. (min)	Differential (min)	Mfrs. List No.	Order Code
50°C	30°C	4°C	66L050	441-8311
70°C	50°C	4°C	66L070	441-8323
80°C	55°C	6°C	66L080	441-8335
90°C	60°C	6°C	66L090	441-8347

Normally Open Types

Normally Closed Types

Opening Temp. Closing Temp. (±5°C)	Reclosing Temp. Reopening Temp. (min)	Differential (min).	Mfrs. List No.	Order Code
50°C	30°C	4°C	66F050	441-8372
70°C	50°C	4°C	66F070	441-8384
100°C	70°C	6°C	66F100	441-8414
110°C	80°C	6°C	66F110	441-8426

311217

Order Code	Price Each			
	1+	25+	100+	250+
All Order Codes	4.46	3.72	3.26	2.71

Bi-Metallic, TO-220**AIRPAX**

- Automatically resetting thermal switches with snap-action bi-metallic SPST contacts
- High temperature epoxy sealed TO-220 package
- Ideal for PC boards, direct mounting on heatsinks etc.
- UL recognised, CSA certified

H=30 (incl pins), W=10.2, D=4.6, Hole dia=3.6, Pin spacing=5.1

The switches are available as either normally closed (opening on temperature rise) or normally open (closing on temperature rise).

Contact rating	1A @ 120V, 48V dc, (30,000 operations) 20mA (down to 1mA @ 5V dc (100,000 operations)
Contact material	Gold plated Silver cross bar

Normally Closed Types

Opening Temp. (±5°C)	Reclosing Temp. (min)	Differential (min).	Mfrs. List No.	Order Code
50°C	30°C	4°C	67L050.	178-799
70°C	50°C	4°C	67L070	152-4711
80°C	55°C	6°C	67L080	152-4704
90°C	60°C	6°C	67L090	152-4705
100°C	70°C	6°C	67L100	152-4706
110°C	80°C	6°C	67L110	152-4712

Normally Open Types

Closing Temp. (±5°C)	Opening Temp. (min)	Differential (min).	Mfrs. List No.	Order Code
50°C	30°C	4°C	67F050	152-4708
70°C	50°C	4°C	67F070	152-4709
90°C	60°C	6°C	67F090	152-4710
110°C	80°C	6°C	67F110	152-4713

Example: A 152-4711 thermal switch will open (break contact) on a rising temperature between 65°C and 75°C and will reset (make contact) on a falling temperature no less than 4°C lower than the actual opening temperature and no lower than 50°C.

212179

Order Code	Price Each			
	1+	25+	100+	250+
All Order Codes	4.29	3.49	3.09	2.57

Bi-Metallic, Insulated**MICROTHERM**

Normally closed bi-metal thermal cut-outs fully insulated with an epoxy coating.

- Suitable for over-temperature protection and temperature control in a wide range of electrical and electronic equipment
- Approved to VDE, CSA, OVE, SEMKO and BEAB
- UL Recognised

H=14.0, W=10.0, D=6.0, Lead L=100

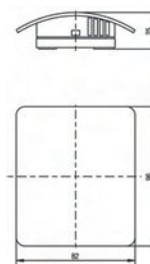
Voltage rating	250V ac	Temperature tolerance	±5°C
Current rating	resistive 2.5A cos φ = 1.0 inductive 1.6A cos φ = 0.6	Contact resistance	40mΩ
Sealing insulation	160 type = polyolefine (blue) other types = textile/lacquer (yellow)	Operating temperature	-30°C to +180°C
Mfrs. List No.	Order Code	Mfrs. List No.	Order Code
T11V 100 05U112L520100	= 152-227,	T11V 110 05U112L520100	= 152-228,
T11V 125 05U112L520100	= 152-229,	T11V 140 05U112L520100	= 152-230,
T11V 150 05U112L529100	= 606-728,	T11V 070 05U112L520100	= 732-606,
T11V 080 05U112L520100	= 732-618,	T11V 160 05U112L531100	= 732-620

212162

Opening Temperature	Order Code	Price Each			
		1+	25+	50+	100+
70°C	732-606	4.01	3.11	2.70	2.25
80°C	732-618	3.63	2.82	2.46	2.05
100°C	152-227	3.81	2.96	2.57	2.14
110°C	152-228	3.81	2.96	2.57	2.14
125°C	152-229	4.01	3.11	2.70	2.25
140°C	152-230	4.01	3.11	2.70	2.25
150°C	606-728	3.84	2.98	2.59	2.16
160°C	732-620	4.01	3.11	2.70	2.25

Thermostats**Indoor and outdoor resistance thermometer**

902523 / 10



Indoor and outdoor resistance thermometers for HVAC applications are mainly used for temperature measurement in rooms and outdoors. Different instrument versions in plastic with different protection ratings are available to suit the particular measurement task.

The measuring insert is fitted with a Pt100 temperature sensor to EN 60 751, Class B in 2-wire circuit as standard.

- For temperatures from -30 to +80°C
- For use in HVAC
- IP20 to IP65 protection

Technical Data:

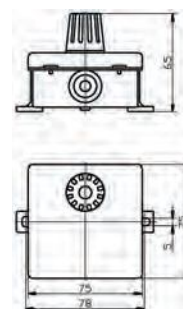
Measuring insert	1 x Pt100 in 2-wire circuit
Operating Temperature	-30 to 80°C
Enclosure Protection	Up to IP65

333906

Operating Temp -30 to 80°C	Order Code 472-4410	Price Each		
		1+	5+	10+
		39.17	37.25	36.04

Indoor and Outdoor Resistance Thermometer

902523 / 11

**Technical Data:**

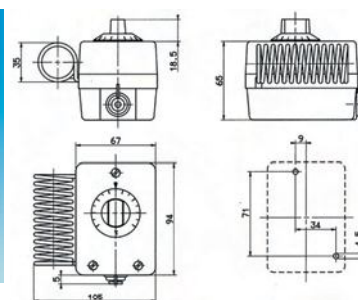
measuring Insert	1x Pt100 in 2-wire circuit
Operating Temperature	-30 to 80°C
Enclosure Protection	

333907

Operating Temperature -30 to 80°C	Order Code 472-4355	Price Each		
		1+	5+	10+
		36.30	34.49	33.39

Room Thermostat

Type AMDR-1



The AMDR type room thermostat is a single-pole temperature controller with a highly sensitive response.

The thermostats are used for controlling ventilators and heating systems, for instance in fattening or breeding sheds.

- control range 0 to +50°C
- Plastic housing in impact-resistant polycarbonate
- Housing dimensions: 67 x 65 x 94mm
- Probe dimensions: 92 x 35mm
- Single-pole snap-action switch with changeover contact

Technical Data:

Max. contact rating	
Terminal 2: 16 (3)A, 230V AC, p.f. = 1 (0.6)	
Terminal 4: 8 (1.5)A, 230V AC, p.f. = 1 (0.6)	
Permissible ambient temperature at housing and probe: -20° to +60°C	
Enclosure protection: EN 60 529, IP54	



Thermostats - continued

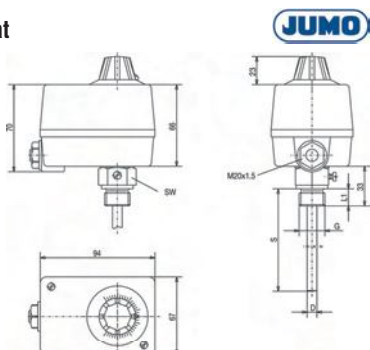
Room Thermostat - continued

Type AMDR-1 - continued

333824

Description	Order Code	1+	5+	10+
Room Thermostat AMDR-1	472-3971	49.25	46.78	45.30

Surface-Mounting Thermostat



The surface-mounting thermostat operates on the principle of volume expansion. If the temperature of the filling medium in the sensing system (consisting of probe, capillary and diaphragm) changes, the volume also changes. The resulting movement of the diaphragm actuates the snap-action switch via a lever mechanism.

Type	Control Range	Immersion Tube	Process Connection
ATHs-1	0...100°C	8 x 120mm	U G 1/2"
ATHs-1	20...150°C	8 x 100mm	U G 1/2"
ATHs-2	0...100°C	8 x 120mm	U G 1/2"

Max. contact rating: 10A / 230V

ATHs-1 = setpoint externally adjustable

ATHs-2 = setpoint internally adjustable

U = pocket with 1/2" external thread

-1 = temperature controller with changeover contact (SPDT)

-2 = temperature monitor with changeover contact (SPDT)

333827

Type	Order Code	1+	5+	10+
ATHs-1 0...100°C	472-3879	56.52	53.71	52.01
ATHs-1 20...150°C	472-3880	109.25	100.51	98.33
ATHs-2 0...100°C	472-3892	58.91	55.99	54.19

Capillary, Control and Limit Thermostats



Control Thermostat



Safety Limit Thermostat

Switch body H = 55 (incl. 1/4" tabs), W = 38, D = 34
Spindle L = 19, Dia = 6 with flat
Fixing centres = 4 x M4 on 28 p.c.d.

Output connections:
1 = N.O., 2 = N.C.,
C = COMMON

- Adjustable switching temperature
- Approvals include VDE, BEAB, IMQ and UL recognised
- Applications include control of boilers, washing equipment, industrial and domestic heating, air conditioning

Control Thermostats

- Changeover (SPDT) contacts enable use for both heating and cooling applications
- Supplied with knob and mounting bezel

Safety Limit Stats

- Available with either SPST or SPDT contacts
- Applications where a maximum safety temperature must not be exceeded

Capillary thermostats operate from a remote liquid-filled sensing bulb through a one metre length of capillary tube. Safety thermostats have a temperature limiter with manual reset and positive cut-off activated if the capillary breaks.

Max head temperature	150°C	Contact rating	15 (2.5)A, 250V ac
Capillary length	1000mm		10A, 380V ac
Temp. rate of change	1°K/min	Min. capillary bending radius	5mm
Contacts	SPDT, silver	Spindle rotation	270°

Temp. Range	Differential Δt	Max. Bulb Temp.	Copper Bulb Dia. L	Order Code
-30°C to +35 °C	1.5 ± 0.5°K	65°C	6 x 215	732-631
0°C to +40 °C	2 ± 1°K	65°C	9.5 x 95	732-643
0°C to +90 °C	4 ± 1°K	150°C	6.5 x 95	560-248
0°C to +120 °C	4 ± 1°K	150°C	6.5 x 95	560-250
0°C to +210 °C	9 ± 2°K	270°C	5 x 136	732-655
0°C to +300 °C	10 ± 2°K	350°C	3.5 x 195	732-667

212170/435937

Switching Temp. Range	Order Code	1+	10+	25+	50+
Control Thermostats					
-30°C to +35 °C	732-631	15.61	15.11	14.43	12.56
0°C to +40 °C	732-643	15.61	15.11	14.43	12.56
0°C to +90 °C	560-248	14.90	14.44	13.63	12.37
0°C to +120 °C	560-250	13.55	12.58	11.86	11.61
0°C to +210 °C	732-655	16.58	16.24	15.38	14.57
0°C to +300 °C	732-667	16.58	16.24	15.38	14.57
Safety Limit Thermostats					
+90°C to +110 °C, SPST	732-679	14.56	14.22	13.31	12.62
+90°C to 110 °C, SPDT	732-680	10.06	9.83	9.19	8.73

Cylinder/Pipe



- Rugged moulded plastic unit with curved metal base plate for mounting directly onto cylinders or pipes
- Bi-Metal sensing strip mounted in the centre of the base plate for maximum sensitivity
- Fitted with graduated setting knob and screw compression cable gland.

Supplied with two security straps (220mm and 2m long), a sachet of thermally conductive paste and an instruction leaflet which details installation and typical applications.

H=109, W=50, D=54

Operating voltage	240V, 50Hz	Switching differential	7°C (approx)
Current rating	15A resistive (3.2kW max. load)	Housing	Grey Plastic to IP20, DIN40050
Temperature range	20°C to 90°C		

212245

Order Code	Mfrs. List No.	1+	10+	50+	100+
179-872	545830	10.23	9.45	8.74	8.11

Temperature Gauges

Temperature Gauge

T208 Series



T208 Series

- Heavy duty industrial/process gauge
- 100mm diameter
- Stainless steel case

T208 Series - Heavy duty 100mm diameter, stainless steel case, 100mm stem length (requires 679-318 thermowell with 1/2" BSP connection).

G 1/2 (1/2" BSP) made from stainless steel 1.4571 (s.s.316), 100mm long x 10mm diameter with locking screw.

Accuracy class	2 to DIN 16203	Pointer and dial	Black on white face
Case	Stainless steel 1.4301 (s.s. 304)	Measuring element	Bimetal coil
Window	Flat instrument glass	Connection	Back central

Thermowell - Supplied separately

212263

Temperature Range	Mfrs. List No.	Order Code	1+	5+	10+	25+
Heavy Duty, 100mm dia. - T208 Series						
0°C to +60°C	T208-406903	679-290	26.63	24.72	23.07	21.64
0°C to +120°C	T208-409003	679-306	19.45	19.06	18.43	18.08
Thermowell for T208	T998-404003	679-318	23.75	23.28	22.51	22.06

Humidity and Temperature Sensors

Humidity and Temperature Sensor

SHT11, 15, 71 & 75

SENSIRION
THE SENSOR COMPANY

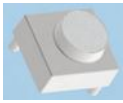
SHT 71 & 51
H = 3.1, W = 5.08,
D = 19.5mm

SHT 71/75

- Relative humidity & temperature
- Precise dew point calculation
- Individually calibrated
- Fully interchangeable, no recalibration
- Ultra fast response time
- Excellent long term stability
- Pin-Type Package (pluggable)
- Thermally isolated
- For High-End applications



SHT 11 & 15
H = 3.1, W =
5.08, D = 7.62mm



SF1
H = 8.2, W = 9.38,
D = 10.12mm

SHT 11/15

- Relative humidity & temperature
- Precise dew point calculation
- Fully calibrated
- Ultra fast response time
- Excellent long term stability
- Fully immersible
- Digital 2-wire interface
- Ultra small size
- Cost-effective

SF1

- Low cost filter solution
- Provides IP67 protection for SHT11 & SHT15
- Facilitates mounting of SHT11 & SHT15
- 99.99% filtration efficiency @ 0.05 m/s air velocity
- Response time of 30s in slow moving air

Relative Humidity (RH)

Range: 0 to 100 % RH
Accuracy: ± 3.5 % RH (SHT11 / 71)
 ± 2 % RH (SHT15 / 75)
Response time: ≤ 4 sec.
Reproducibility: ± 0.1 % RH
Resolution: 0.03 % RH

Temperature (T)

Range: -40 to 120 °C
Accuracy: ± 0.5 °C @ 25 °C
Reproducibility: ± 0.1 °C
Resolution: 0.01 °C
Operating temperature: -40 °C to 120 °C

Electrical Data

Power consumption: Typ. 30 μ W (@ 5V, 12-bit, measure every 2 sec.)
Typ. 1 μ W (@ 2.4V, 8-bit, measure every 2 min.)
Supply voltage range: 2.4 to 5.5 V
Input current: 0.5 mA
During measurement
In standby: ≤ 0.3 μ A

Type
SMT. Standard
SMT. High accuracy
4-pin single-in-line. Standard
4-pin single-in-line. High accuracy

Mfrs. List No.	Order Code
SHT11	159-0511
SHT15	159-0512
SHT71	159-0513
SHT75	159-0514

234886

Mfrs. List No.	Order Code	1+	10+	25+
SHT11	SMD 159-0511●	15.33	14.72	14.13
SHT15	SMD 159-0512●	18.47	17.74	17.02
SHT71	SMD 159-0513●	18.47	17.74	17.02
SHT75	SMD 159-0514●	21.41	20.55	19.74
Filter Cap				
SF1	SMD 139-9624●	2.52	2.41	2.31

Humidity and Temperature Sensor

Evaluation Kit EK-H2

SENSIRION
THE SENSOR COMPANY



Sensirion
Supplied with European power supply only

The EK-H2 evaluation kit offers a plug-and-play environment to demonstrate the unique features of all Sensirion humidity and temperature sensors. It can easily be adapted to your specific application and therefore provides an outstanding development and demonstration tool for your future product, enabling fast prototyping.

Including:

- 2 x SHT11, 2 x SHT15 & 2 x SHT7 humidity sensors (incl. connecting cables)
- Serial interface cable (9-pole)
- Power supply 230 VAC/ 9 VDC for board
- Microprocessor and display board ASD11
- Humi Viewer (visualization) software on CD ROM documentation
- Packed in a handy box

For Technical Humidity Sensor Data see Order Codes 159-0511, 159-0512, 159-0513 & 159-0514

234885

	Order Code	Price Each
Evaluation Kit V2.1	SMD 120-7219●	225.55
Adaptor UK/Euro	SMD 561-320	3.77

Coming soon



Register your interest for items that are 'Coming Soon' at www.farnell.co.uk and we'll email you to let you know that they're in stock.

Capacitive humidity sensor

MK33 Series



- For use in corrosive applications
- Mechanically robust
- Good linearity
- Condensation-resistant, very high dew point temperature
- Alcohol-resistant
- Low hysteresis
- Temperature-shock-resistant, extreme temperature operating range
- Resistant to many chemical agents



Measuring Principle	Capacitive Polymer Humidity Sensor	Linearity	< 2 %RH (20...90% RH)
Humidity Operating Range	0 ... 100% Relative Humidity	Hysteresis	< 2 %RH
Max. Dewpoint Temp. (100%RH)	+95 °C	Response Time t_{90}	< 10sec, 50...0% RH
Temperature Operating Range	-40...+190 °C	Frequency Range	1...100 kHz
Capacity	300 \pm 40 pF (bei 30%RH)	Electric Strength	< 12 VAC
Sensitivity	0.45 pF / % RH (20...95 % RH)	Connectors	SIL
Loss Factor	< 0,01	Dimension	5,00 x 3,81 x 0,38

408200

Type	Order Code	1+	10+	25+
MK33	SMD 959-6151●	34.32	31.20	28.60

Humidity Sensors

Humidity Sensor - SMD

Analog voltage output



- Low voltage supply requirements
- Near linear voltage output
- Fast response time
- Moulded thermoset plastic housing
- Stable, low drift performance
- Chemically resistant
- HIH-4031 is fitted with a hydrophobic filter allowing it to be used in condensing environments

H = 2.67, W = 8.59, D = 4.17mm

Supply Voltage: 4 to 5.8V dc
Supply Current: 200 μ A
Response time: 5s
Operating Temperature: -40 to 85 °C

505703

Mfrs. List No.	Order Code	1+	5+	10+	25+	50+
HIH-4030-001	SMD 156-6262●	14.46	13.14	12.50	11.84	11.19
HIH-4031-001	SMD 156-6263●	16.70	15.17	14.42	13.65	12.90

HIH-4000 Series Humidity Sensors



- Moulded thermoset plastic housing with cover
- Linear voltage output vs %RH
- Laser trimmed interchangeability
- Low power design
- High accuracy
- Fast response time
- Stable, low drift performance
- Chemically resistant
- Typical applications: refrigeration, drying, meteorology and OEM assemblies

Package Style: Solderable SIP
RH Accuracy: 3.5 %
RH Interchangeability: ± 5 % RH, 0-60% ± 8 % @ 60-100% RH Typ.
RH Hysteresis: 3% of RH Span Maximum
RH Repeatability: 0.5% RH
RH Response Time, 1/e: 15 s in slow moving air @ 25 °C
RH Stability: ± 0.2 % RH Typical @ 50% RH in 1 Year
Supply Voltage: 4.0 to 5.8V dc
Supply Current: 500 μ A Max.
Operating Humidity Range: 0 to 100% RH, non-condensing
Operating Temperature Range: -40 to 85 °C

447994

Lead Pitch	Mfrs. List No.	Order Code	1+	5+	10+	25+	50+
2.54mm	HIH-4000-001	SMD 118-7547●	19.50	18.13	17.75	16.83	14.87
1.27mm	HIH-4000-002	SMD 118-7548●	19.19	17.16	15.53	14.77	12.94

Technical information at your fingertips



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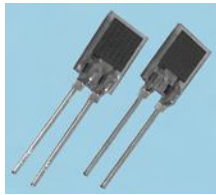


Humidity Sensors - continued

Humidity Sensor - SIP
Analog voltage output

Honeywell

New



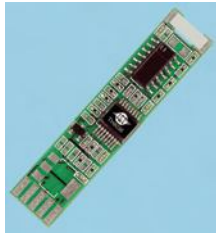
- Polymer sensing for enhanced resistance to contamination
 - Reduced temperature dependence
 - Low hysteresis
 - Enhanced sensitivity and response
 - Long term stability
 - High operating temperature
- Uncased - H = 7, W = 5, D = 0.65mm
Cased - H = 10.18, W = 6.52, D = 2.96mm

The HCH-1000 Series humidity sensor is a capacitive polymer sensor designed for relative humidity measurement. The sensor converts humidity value into capacitance, which can be measured electronically. Polyimide is used as a humidity sensing material in these devices because of its inherent IC processing compatibility, reduced temperature dependence and resistance to contamination. The sensor consists of a grid top electrode, a polyimide layer and a bottom electrode. This construction provides enhanced sensitivity when compared to the standard structure. Two versions are available, a cased version for enhanced dust protection and an un-cased version.

Sensitivity 0.55 to 0.65 pF / %RH
Operating humidity range 0% to 100% RH
Response time 15s
Operating Temperature -40 to 120°C

505708

Case Style	Mfrs. List No.	Order Code	1+	5+	10+	25+	50+
Un-Cased	HCH-1000-001	156-6264	5.01	4.56	4.32	4.10	3.88
Cased	HCH-1000-002	156-6265	5.47	4.97	4.72	4.48	4.22

Analogue humidity module
LinPicco™ basic series

- For accurate relative humidity measurement
- Low power consumption, current loop version supplied from current loop
- Temperature-compensated
- Rapid response
- Good linearity
- Drift-stable
- Low hysteresis
- Very small dimensions
- Mechanically robust



Sensor Type P14 SMD
Measurement principle: Capacitive humidity sensor
Specification range: 15...85 % RH
Accuracy: < 3 %RH @ 23°C
Humidity range: 0...99.9 % RH, non condensing
Operating temperature range: -25... +85 °C
Humidity measurement range: +85 °C
Current consumption: < 3 mA
Storage temperature range: -40... +100 °C @ max. 95 % RH, non condensing
Dimensions: L=47,0 x W=10,0 x H=2,8 mm
Terminal connectors: Soldering terminals for VCC, Analog Out, Loop-through of optional temperature sensor

Type	Order Code	Output signal 0...100% RH	Input Voltage
LINPICCO (TM) BASIC A01	959-6100	0...1V	8...32V=
LINPICCO (TM) BASIC A05	959-6119	0...5V	8...32V=
LINPICCO (TM) BASIC A0545	959-6127	10...90% Vcc	4,5...5,5V
LINPICCO (TM) BASIC A420	959-6135	4...20mA	8...32 V

408198/436281

Type	Order Code	1+	10+	25+
LINPICCO (TM) BASIC A01	959-6100	24.25	21.56	19.39
LINPICCO (TM) BASIC A05	959-6119	22.97	20.42	18.37
LINPICCO (TM) BASIC A0545	959-6127	21.27	18.90	17.02
LINPICCO (TM) BASIC A420	959-6135	26.65	23.69	21.33

Capacitive humidity sensor
Series P14

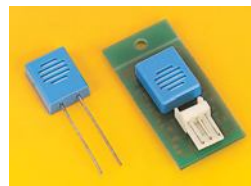
- Laser-trimmed version available, saving calibration for many applications
 - Version with integrated temperature resistance, for dew point determination and for measurements above the dew point by heating.
 - Mechanically robust
- Measuring principle capacitive humidity sensor
Humidity operating range 0 ... 100% RH (max. DP = 85°C)
Temperature range -30... +150 °C
Capacity 150 ± 50pF (@ 30%rF)
Loss factor <0,01
Linearity < 1,5 %RH (15...90% RH)
- Hysteresis < 1,5 %RH
Response time t_{93} < 12 sec, 50...0% RH
Frequency range 1...100 kHz
Electric strength < 12 VAC
Connectors SIL

Type	Order Code	Max. Dewpoint-temperature	Temperature	Draft [pF/%RH]	Dimension of Chip (L x B x H) in mm
P14	959-6143	85°C	none	0,25	5,00 x 3,81 x 0,38
P14 THERMO	959-6178	85°C	PT100C	0,25	7,70 x 3,81 x 0,38

408199

Type	Order Code	1+	Price Each	10+	25+
P14	959-6143	16.55	15.03	13.78	
P14 THERMO	959-6178	19.70	17.90	16.41	

Resistive Sensor and Module, 20-100% RH Range



- Sensor measures up to 100% relative humidity
- Can be used in conditions liable to dew condensation
- Module is temperature compensated
- Module is easy to install and connect.

Sensor: H = 15, W = 12, D = 4.5, Leads = 24, Lead pitch = 5

Module: L = 35, W = 20, H = 75 (above PCB), Mounting hole dia = 3.2

The module incorporates the 732-837 sensor to give a ready-to-use unit. Resistance of the sensor decreases with increasing RH. Output voltage of the module (1.5V to 3.1Vdc) corresponds linearly to RH (25 to 100%)

Sensor/Module	25% to 100% RH	Module	Working voltage	5.0 ± 0.2Vdc
Operating humidity range	25% to 100% RH	Storage temperature	-40°C to +85°C	
Operating temperature range	0°C to +50°C	Storage humidity	0 to 100% RH	
Measurement accuracy	±5% RH	Measurement range	25 to 100% RH	
Sensor		Current	2mA max.	
Drive voltage, rated power	5Vac, 0.3mW	Output voltage	1.5 to 3.1 V	
Measuring frequency				
Impedance (25°C, 50% RH)	KΩ±30KΩ			

212358

Module	Order Code	1+	10+	25+	100+	250+
Module	122-6686	15.14	12.67	11.13	9.61	8.38

Pressure Sensors

Honeywell

Pressure Sensors
24PC SMT Series

- Alignment pins for position accuracy
- Small package size
- 3.18mm diameter pick up feature for use in pick and place machines
- Max peak reflow temperature of 260°C
- True wet/wet differential sensing
- Proven elastomeric interconnections of the 20PC family
- Sensor consists of only five components
- Elastomeric construction

- Wide operating temperature range -40 to 85°C

Excitation Voltage	10V dc Typ.	Storage Temperature Range	-55 to 100°C
Max. Excitation Voltage	12V dc	Vibration	150g half sine 11ms
Input Resistance	5 kΩ	Shock	Qualification tested to 150g
Output Resistance	5 kΩ	Weight	0.5g
Operating Temperature Range	-40 to 85°C		

Pressure Range	Max. Overpressure	Mfrs. List No.	Order Code
0 to 1psi	20psi	24PC01SMT	122-5330
0 to 5psi	20psi	24PC05SMT	122-5331
0 to 15psi	45psi	24PC15SMT	122-5332

449821

Mfrs. List No.	Order Code	1+	10+	25+	+	+
24PC01SMT	122-5330	7.70	7.00	6.42	--	--
24PC05SMT	122-5331	7.70	7.00	6.42	--	--
24PC15SMT	122-5332	7.70	7.00	6.42	--	--

Over 480,000 products online



Pressure Sensors

26PC SMT Series



- Alignment pins for position accuracy
- Small package size
- 3.18mm diameter pick up feature for use in pick and place machines
- Max peak reflow temperature of 260°C
- True wet/wet differential sensing
- Proven elastomeric interconnections of the 20PC family
- Temperature compensation
- End point calibration

- Sensor consists of only five components
- Elastomeric construction
- Wide operating temperature range -40 to 85°C

Excitation Voltage	10V dc Typ.	Storage Temperature Range	-55 to 100°C
Max. Excitation Voltage	16V dc	Vibration	150g half sine 11ms
Input Resistance	7.5 k Ω	Shock	Qualification tested to 150g
Output Resistance	2.5 k Ω	Weight	0.5g
Operating Temperature Range	-40 to 85°C		

Pressure Range	Max. Overpressure	Mfrs. List No.	Order Code
0 to 1psi	20psi	26PC01SMT	122-5333
0 to 1psi	20psi	26PC05SMT	122-5334
0 to 1psi	45psi	26PC15SMT	122-5335

449825

Mfrs. List No.	Order Code	1+	10+	Price Each	25+	+	+
26PC01SMT	122-5333	14.33	13.02	11.95	--	--	--
26PC05SMT	122-5334	10.59	9.63	8.83	--	--	--
26PC15SMT	122-5335	10.75	9.77	8.96	--	--	--

Amplified Low Cost

Honeywell



A2 Package H=17 W=14 D=16.8
D4 Package H=11.1 W=14 D=24.8
D4 - ASDX Package. H=11.1, W=14, D=24.8
D4 - ASDXL Package. H=17, W=14, D=16.9

- Miniature PCB mount dual in line package
- Temperature compensated
- Precision ASIC conditioning
- Amplified voltage output
- Single 5V supply
- Suitable for measuring Differential, Gauge and absolute pressures
- Differential devices allow pressure to either side of the sensing diaphragm and can be used for differential or gauge measurements

The ASDX/ASDXL are amplified versions of the industry leading SDX series. This family is fully calibrated and compensated using an on-board ASIC offering high level (4V span) output. Designed for use with non-corrosive, non ionic media e.g. air and dry gases.

Supply Voltage	4.75 to 5.25V dc
Output	0.5 to 4.5V dc (Ratio metric within supply voltage range)
Full Scale Output	4.5 Vdc ($\pm 80\mu V$ -ASDX, $\pm 100mV$ -ASDXL)
Zero Pressure Output	0.5 Vdc ($\pm 80\mu V$ -ASDX, $\pm 100mV$ -ASDXL)
	ASDX: 0.440-2.5V ($\pm 80\mu V$), ASDXL: 0.440-2.5V ($\pm 100mV$)
Operating Temperature	ASDX: -20°C to 105°C, ASDXL 0°C to +70°C
Accuracy	ASDX $\pm 2\%$, ASDXL $\pm 2.5\%$
Response Time	8 ms
Quantization Step	3 mV
Proof Pressure	$\pm 5^\circ H_2O = 180^\circ H_2O$
Proof Pressure	$\pm 10^\circ H_2O = 180^\circ H_2O$
Proof Pressure	0 to 10" $H_2O = 20psi$
Proof Pressure	1 and 5 psi = 20psi
Proof Pressure	15 and 30psi = 2 x rated pressure
	100psi = 1.5 x rated pressure

249419

Operating Pressure	Mfrs. List No.	Order Code	1+	Price Each	10+	25+
Absolute						
0 to 15psia	ASDX015A24R	419-7586	22.62	22.01	21.43	
Differential / Gauge						
0 to 1psid(g)	ASDX001D44R	419-7598	22.62	22.01	21.43	
0 to 5psid(g)	ASDX005D44R	419-7604	22.62	22.01	21.43	
0 to 15psid(g)	ASDX015D44R	419-7616	22.62	22.01	21.43	
0 to 30psid(g)	ASDX030D44R	419-7628	22.62	22.01	21.43	
0 to 100psid(g)	ASDX100D44R	419-7630	19.91	17.43	15.93	
0 to $\pm 1psid(g)$	ASDX001D44D	419-7641	17.66	15.46	14.13	
0 to $\pm 15psid(g)$	ASDX015D44D	419-7653	16.02	14.56	14.18	

Basic Sensors - SX Series

Honeywell



Single Port SX...AD2/SX...GD2
H=13.84, W=13.97
D=11.94
Pressure Port O/D=2.6

Dual Port SX...DD4
H=9.65, W=13.97
D=11.94
Pressure Port O/D=2.28

Pin Spacing = 15.24 x 2.54



Sx...N Series
H=27.2, W=29.2, D=10.2
Pressure ports O/D=4.83
Fixing Centers=22.9
Pin Spacing=2.54

- Easy pressure connection using plastic tubing
- DIP package for easy PCB mounting
- Standard differential types can be used for gauge or differential pressure measurements

Pressure sensors featuring only the basic shear stress IC pressure sensor element. The sensors are for use with non-corrosive and non-ionic media, eg. air, dry gases.

Reference conditions	Vs = 5V dc, TA = 25°C		Repeatability	0.5% FS typ	
Supply voltage	12V dc max.		Output impedance	4.5k Ω	
Linearity & hysteresis	0.2% FS typ., 0.5% FS max		Operating temp. range	-40°C to +85°C	
Operating Pressure Range	Maximum Pressure	Full Scale Span (typ)	Operating Pressure Range	Maximum Pressure	Full Scale Span (typ)
0 to 1psig	20psi	20mV	0 to 100psig	150psi	150mV
0 to 5psig	20psi	75mV	0 to 150psid	200psi	150mV
0 to 15psia	30psi	110mV			

212228

Operating Pressure	Mfrs. List No.	Order Code	1+	Price Each	10+	25+
Dip Package						
0 to 1psig	SX01GD2	674-229	18.32	16.03	14.66	
0 to 1psid	SX01DD4	674-230	15.57	13.63	12.46	
0 to 5psig	SX05GD2	674-242	18.32	16.03	14.66	
0 to 100psig	SX100GD2	674-308	18.32	16.03	14.66	
Standard Package						
0 to 1psid	SX01DN	414-773	22.43	19.64	17.95	
0 to 15psid	SX15DN	414-797	22.43	19.64	17.95	
0 to 30psid	SX30DN	414-803	22.43	19.64	17.95	
0 to 100psid	SX100DN	414-815	20.09	17.59	16.08	
0 to 150psid	SX150DN	414-827	22.43	19.64	17.95	

Basic Sensors - SCC Series

Honeywell

Temperature Compensated, Constant Current Drive

- Low cost pressure sensors offering a temperature stable output when driven with a constant current source
- Temperature coefficients for span and resistance effectively cancel each other out between 0°C and 50°C
- For use with non-corrosive and non-ionic media, eg. air, dry gases

The sensors are housed in the same DIP and standard packages as SX series (see above) and have the same pin connections.

Reference conditions	I _s = 1.0mA, T _A = 25°C
Supply current	1.5mA max
Linearity, hysteresis and repeatability	0.25% FS typ, 0.5% FS max
Output impedance	5k Ω typ.
Compensated temp. range	0°C to 50°C
Operating temp. range	-40°C to +85°C

Operating Pressure Range	Maximum Pressure	Full Scale Span
0 to 5psig	20psi	25 to 65mV
0 to 15psia	30psi	40 to 95mV
0 to 100psig (g)	150psi	85 to 225mV

212226

Operating Pressure	Mfrs. List No.	Order Code	1+	Price Each	10+	25+
Dip Package						
0 to 15psia	SCC15AD2	674-310	14.87	13.02	11.90	
0 to 5psig	SCC05GD2	674-321	10.66	10.15	9.68	
0 to 5psid	SCC05DD4	674-333	13.32	11.66	10.66	
Standard Package						
0 to 15psia	SCC15AN	179-275	15.10	13.22	12.80	
0 to 5psid (g)	SCC05DN	179-276	16.86	14.76	13.49	
0 to 100psig (g)	SCC100DN	179-279	16.86	14.76	13.49	

Temperature Compensated Sensors - SCX Series

Honeywell



Pins
1 Temp output +
2 VS
3 Output +
4 Ground
5 Output-
6 Temp output-

H=25.4, W=27.9, D=26.2,
Pressure ports O/D=4.83,
Fixing centres=21.6, Pin spacing=2.54

This low cost range is designed for applications where the user can typically provide fine adjustment of zero and span in external circuitry.

- Very tight offset and full scale calibration
- Guaranteed temperature compensation to max 1% over a 70°C temperature range
- For non-corrosive, non-ionic fluids, eg. dry gases
- Rugged plastic package
- Differential types can be used for gauge or differential pressure measurement

Reference V _s	12V dc
Reference Temp	25°C
Supply voltage, V _s	+30Vdc max.
Linearity & hysteresis	0.1% FS typ, 0.5% FS max (precision) 0.2% FS typ, 1% FS max (low cost)
Repeatability	0.2% FS typ, 0.5% FS max (precision)
Span shift with temp (0°C to 70°C)	0.2% FS typ, 1.0% FS max (precision) 0.4% FS typ, 2.0% FS max (low cost)
Offset shift with temp (0°C to 70°C)	$\pm 0.1mV$ typ, $\pm 0.5mV$ max (precision) $\pm 0.2mV$ typ, $\pm 1.0mV$ max (low cost)
Output impedance	4k Ω typ
Operating temp range	-40°C to +85°C
Offset calibration	0 \pm 0.3mV (precision), 0 \pm 1.0mV max (low cost)

Pressure Sensors - continued

Temperature Compensated Sensors - SCX Series - continued

212337

Pressure	Order Code	1+	10+	25+
0 to 15psia	414-839	34.87	30.51	27.89
0 to 1psid	414-840	34.87	30.51	27.89
0 to 15psid	414-852	34.87	30.51	27.89
0 to 15psia	414-864	39.04	34.16	31.23
0 to 1psid	414-888	43.28	37.86	34.62
0 to 5psid	414-890	39.04	34.16	31.23
0 to 15psid	414-906	39.04	34.16	31.23
0 to 30psid	414-918	39.04	34.16	31.23
0 to 100psid	414-920	39.04	34.16	31.23
0 to 150psid	414-931	43.59	38.14	34.87

Temperature Compensated Sensors
DIP Package — SDX Series

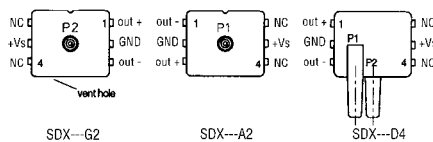
Honeywell

Single Port
SDX A2 Series
SDX G2 Series
H=15.1, W=13.97,
D=11.94
Pressure port O/D=2.67



Dual Port
SDX D4 Series
H=9.65, W=13.97,
D=11.94
Pressure port O/D=2.28

Pin Spacing=15.24x2.54



The polarity indicated is for pressure applied to:

SDX---G2 : P2 (backward gage)
SDX---A2 : P1 (forward gage)
SDX---D4 : P2 (backward gage)

This family of compensated and calibrated sensors is the second generation of Honeywell SCX Series. Incorporating "constraint-wafer" technology the SDX Series provides:-

- Up to 5 times improvement of long term stability and repeatability
- Greater immunity to package stress
- Tight calibration of offset and span
- Temperature compensation of offset and span, giving an accurate and stable output over 0-50°C range
- New DIP package features standard IC dimensions and pin spacing for easy PCB mounting
- For use with non-corrosive, non-ionic media, eg. air and dry gases

Reference conditions	$V_S = 12V, T_A = 25^\circ C$
Max. supply voltage	$V_S = 20V$
Linearity & hysteresis	$\pm 0.2\% FS$ typ, $\pm 1\% FS$ max
Repeatability	$\pm 0.2\% FS$ typ, $\pm 0.5\% FS$ max
Span shift with temp. (0°C to 50°C)	$\pm 0.4\% FS$ typ, $\pm 2\% FS$ max
Offset shift with temp. (0°C to 50°C)	$\pm 0.2mV$ typ, $\pm 1mV$ max
Output impedance	SDX = 4k Ω typ, SDXL = 6k Ω typ.
Operating temp. range	-40°C to +85°C
Offset calibration	0 $\pm 1mV$
Common mode voltage	1.5V min, 3.0V typ, 5V max
Operating Pressure Range	Proof Pressure Span
0 to 10" H ₂ O	5 psi 25mV
0 to 1psig	20 psi 18mV
0 to 5psig	20 psi 60mV
Operating Pressure Range	Proof Pressure Span
0 to 15psig	30 psi 90mV
0 to 100psig	150 psi 100mV

212227

Operating Pressure	Mfrs. List No.	Order Code	1+	10+	25+
Low Pressure					
0 to 5" H ₂ O	SDX005IND4	434-6063	39.70	34.74	31.76
0 to 10" H ₂ O	SDX010IND4	434-6075	32.66	28.58	26.13
Standard Pressure					
0 to 15psia	SDX15A2	674-114	20.92	18.31	16.74
0 to 1psig	SDX01G2	674-126	20.92	18.31	16.74
0 to 1psid	SDX01D4	674-138	20.92	18.31	16.74
0 to 5psig	SDX05G2	674-140	23.83	20.86	19.07
0 to 15psig	SDX15G2	674-163	20.92	18.31	16.74
0 to 15psid	SDX15D4	674-175	20.92	18.31	16.74
0 to 100psig	SDX100G2	674-205	20.92	18.31	16.74

Ultra Low Pressure Sensors - Sursense™

Honeywell



- Differential or Gauge pressure
- Self-compensating
- Small outline dimensions
- Superior linearity
- Almost no position sensitivity
- Exceptional stability
- Pressure media must be clean, non-corrosive and non-ionising, i.e. dry gases

DUXL: H=7.1, W=19.1 (excl. pins), D=12.7
DCXL & DCAL: H=26.2 (incl. ports), W=27.4 (excl. pins), D=20.3

The Sursense™ family of low-pressure sensors is based upon proprietary, DSC (Dynamic Self-Compensation), technology designed to reduce all output offsets and common mode errors. Changes in output due to temperature, warm-up, long term stability and position sensitivity have all been significantly reduced when compared with conventional sensors. In addition, all models utilise a stress relieving construction that reduces zero offset and linearity errors due to mounting induced stresses.

DUXL differential & gauge

Supply voltage	≤ 8
Output span (Ratiometric @ 4.5V)	4-8mV
Offset voltage	< 10
Offset warm-up shift (first 10secs.)	$\pm 10\mu V$
Offset position sensitivity ($\pm 1g$)	$\pm 15\mu V$
Temp. effect on offset (0-50°C)	100 μV
Temp. effect on span (0-50°C)	100 μV
Combined linearity and hysteresis	0.1% nom.
Input resistance	1-3K Ω
Storage temperature	-40°C to +125°C
Common mode pressure	50psig

Amplified, PCB Mounting Differential, bidirectional gauge

Pressure range	310-6883	310-6895	310-6901
Supply voltage	± 1 in H ₂ O	± 5 in H ₂ O	± 10 in H ₂ O
Full scale span	5V dc	5V dc	3-16V
Null offset	$\pm 2V$	$\pm 2V$	$\pm 2V$
Sensitivity	2.25V dc	2.25V dc	2.25V dc
Combined linearity and hysteresis error	0.4 V/in H ₂ O	0.8 V/in H ₂ O	0.4 V/in H ₂ O
Storage Temperature	$\leq \pm 0.25\%$ Span	$\leq \pm 0.25\%$ Span	$\leq \pm 0.25\%$ Span
Media - P1	-40 to +125°C	-40 to +125°C	-40 to +125°C
Media - P2	Wetted materials	Wetted materials	Wetted materials
Operating temperature	DRY Gasses only	DRY Gasses only	DRY Gasses only
	-25 to +85°C	-25 to +85°C	-25 to +85°C

212422

Operating Pressure	Mfrs. List No.	Order Code	1+	10+	25+
Differential and Gauge					
0 to 1" H ₂ O	DUXL01D	310-6986	51.75	48.73	45.14
Amplified, PCB Mounting Differential					
0 to 1" H ₂ O	DC001NDC4	310-6883	80.19	74.73	70.81
0 to 5" H ₂ O	DC005NDC4	310-6895	71.06	66.33	62.83
0 to 10" H ₂ O	DC010NDC4	310-6901	61.74	58.21	55.14

Note: Differential units have an offset voltage of 2.25V and span of $\pm 2V$ nominal

Basic Sensors - 24PC Series

Honeywell



Gauge, Absolute: H=8.0 (excl. pins), W=12.7, D=21.8, Pressure port O/D=5.1
Differential: H=8.0 (excl. pins), W=12.7, D=34.4, Pressure ports O/D=5.1
High pressure gauge: H=8.0 (excl. pins), W=12.7, D=23.8, Pressure port=1/4-28UNF, flange dia.=9.14

Connections (2.5 spacing): 1=V_S (+) (notched pin), 2=Output (+), 3=Ground (-), 4=Output (-)

- Measure vacuum or positive pressures in air, gas or liquids
- High pressure gauge types (100psig and 250psig) have threaded ports

A range of miniature low cost basic sensors. The sensors have wet/wet capability, incorporating a seal either side of the diaphragm, one of which is unique conductive seal offering improved reliability for the product range.

Supply voltage	10V dc (nom.), 12V dc (max.)
Linearity (typ.)	Gauge, differential=0.25% span, 15 psia = 15mV/psia typ, 30 psia = 11mV/psi typ. (see note below)
Repeatability and hysteresis	Gauge, differential = $\pm 0.15\%$, absolute = 0.5%
Input/output resistance	5k Ω
Temperature range	-40°C to +85°C
Media	Wet or dry, compatible with polyetherimide,

Note: Although non-compensated, these sensors exhibit extremely good temperature stability (0.5% of span) when driven by current rather than voltage (1.6 to 2.0mA recommended).

212242/46274

Absolute	Mfrs. List No.	Order Code	1+	10+	25+	50+
2 to 15psia	24PCCFA6A	723-7753	11.42	9.46	8.51	7.74
2 to 30psia	24PCDFA6A	723-7765	11.42	10.91	10.67	10.15
Differential						
0 to 0.5psid	24PCEFA6D	731-626	9.06	7.35	7.17	6.98
0 to 1psid	24PCAFA6D	731-638	11.33	11.02	10.65	9.60
0 to 5psid	24PCBFA6D	731-640	9.06	7.35	7.17	6.98
0 to 15psid	24PCCFA6D	731-651	11.33	11.02	10.65	9.60
0 to 30psid	24PCDFA6D	731-663	9.06	7.35	7.17	6.98
Gauge						
0 to 0.5psig	24PCEFA6G	731-675	10.73	10.46	10.08	9.37
0 to 1psig	24PCAFA6G	731-687	11.33	11.02	10.65	9.60
0 to 5psig	24PCBFA6G	731-699	11.33	11.02	10.65	9.60
0 to 15psig	24PCCFA6G	731-705	9.06	7.35	7.17	6.98
0 to 30psig	24PCDFA6G	731-717	11.33	11.02	10.65	9.60
0 to 100psig	24PCFFM6G	731-729	11.33	11.02	10.65	9.60
2 to 15psia	24PCCFA6A	723-7753	11.42	9.46	8.51	7.74
2 to 30psia	24PCDFA6A	723-7765	11.42	10.91	10.67	10.15

Mass Flow Sensor

OMRON



D6F-01A1
H = 33, W = 33, D = 9mm



D6F-05N2
H = 22.1, W = 62, D = 21.6mm

These small mass flow sensors combine high accuracy with fast response. Therefore they have many applications sensing air, non-corrosive gas and Liquid Natural Gas (LNG) in medical apparatus, combustion control and analysis equipment. Output is via a Molex 3 pin connector. The devices are supplied complete with the connector and 100mm lead.

Supply voltage - V dc	Min.	Max.	Operating Humidity	Min.	Max.
Current Consumption	10.8	26.4	Operating Temperature	-25°C	Under 85% RH
		60mA			+55°C

418055

Gas Type	Mfrs. List No.	Order Code	1+	5+	10+
Air, 0 - 1 L/min	D6F-01A1-110	100-7612	91.89	82.70	73.50
LNG, 0 - 5 L/min	D6F-05N2-000	100-7614	165.12	156.85	149.01

Temperature Compensated Sensors

Honeywell

- 26 PC Series



Differential:
H=8.0 (excl. pins),
W=12.7, D=34.4,
Pressure ports O/D=5.1

Gauge:
H=8.0 (excl. pins),
W=12.7, D=21.8,
Pressure port O/D = 5.1

Connections (2.5 spacing)
1=Vs (+) (notched pin)
3=Ground (-)
2=output (+)
4=output (-)

- Calibrated null and span
- Temperature compensated for span
- Can be used to measure vacuum or positive pressures in air, gas or liquids

Miniature low cost pressure sensors with compensated outputs. Wet/wet capability of the sensor incorporates a seal either side of the diaphragm, one of which is a unique conductive seal offering improved reliability for the product range.

Supply voltage	10v dc (nom) 16v dc (max)	Input resistance	7.5kohm
Null offset	±1.5mV	Output resistance	2.5kohm
Linearity	0.25% span	Temperature range	-40°C to +85°C
Sensitivity shift (0-50°C)	±1.0% span		(0-50°C compensated)
Repeatability and hysteresis	0.2% span	Media	Wet or dry, compatible with polyetherimide, silicon and
Response time	1ms (max.)		

212231

Differential	Mfrs. List No.	Order Code	1+	10+	25+	50+
0 to 1psid	26PCAFA6D	731-742	12.90	11.17	10.87	10.60
0 to 5psid	26PCBFA6D	731-754	12.90	11.17	10.87	10.60
0 to 15psid	26PCCFA6D	731-766	12.90	11.17	10.87	10.60
0 to 30psid	26PCDFA6D	731-778	12.90	11.17	10.87	10.60
Gauge	Mfrs. List No.	Order Code	1+	10+	25+	50+
0 to 1psig	26PCAFA6G	731-780	12.90	11.17	10.87	10.60
0 to 5psig	26PCBFA6G	731-791	16.89	16.21	15.31	14.55
0 to 15psig	26PCCFA6G	731-808	12.90	11.17	10.87	10.60

Low Pressure Differential Sensors

Honeywell

Temperature Compensated - 176 PC Series



- Miniature package
- Low pressure measurement
- Calibrated null and span
- Temperature compensated for span over 0 °C- 50°C

This range of very low pressure sensors utilizes the latest silicon technology to achieve a higher sensitivity and lower null shift than was previously achievable.

Connections
1. Vs (+)
2. Output A
3. Ground (-)
4. Output B

Higher sensitivity requires less amplification and improves the signal to noise ratio.

H=21.5, W=21.5, D= 34.3 (overall).
Pressure port O/D = 7

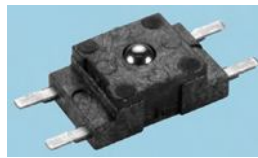
Supply voltage	10V dc (nom.), 16V dc (max.)
Null offset	±2mV
Linearity	0.25% FS
Sensitivity shift (0-50°C)	4.0% span (0-14°), ±3.5% span (0-28°)
Repeatability and hysteresis	0.25% span
Temperature range	-40°C to +85°C (0°C to 50°C compensated)
Media	Port 2: wetted compatible with polyester housing, epoxy adhesive silicon, borosilicate and silicon-to-glass bond.

212241

Operating Pressure	Mfrs. List No.	Order Code	1+	5+	10+	25+
0 to 7"H2O	176PC07HD2	731-821	41.16	39.10	37.05	36.31
0 to 14" H2O	176PC14HD2	731-833	48.28	45.87	43.45	41.31

Force Sensor

Honeywell



SMD Version
H = 3.75, W = 9.14, D = 5.59mm



PCB Mount and Bracket
Body - H = 9, W = 12.7, D = 8mm

- Robust performance characteristics
- Extremely low deflection, typically 30 microns at full scale
- Precise force sensing
- Electrically ratiometric output
- Mounting brackets available separately

Piezo-resistive sensing element in Wheatstone bridge circuit. Force is applied through stainless steel plunger directly to sensing element. Applications include load and compression sensing, variable tension control, contact sensing, robotic end effectors, medical.

Supply voltage	721-6671 10V dc (nom.)	310-7620 5V dc (nom.)
Force range	1500grams	0 to 1500g
Overforce	5500 grams (max.)	4500 grams (max.)
Span	290 to 430mV (360mV typ.)	60mV (at 5V dc)
Response time	1m sec	
Temperature range	-40°C to +85°C	-40°C to +85°C

212310

	Order Code	Order Code	1+	5+	10+
Force sensor	FSG-15N1A	721-6671	35.69	33.20	32.48
Force sensor - SMD	FSS1500NSB	SMD-310-7620	43.11	39.93	37.82
Mounting brackets, pack of 5	PC-15132	721-6683	5.76	5.37	5.25

Air Flow Detector

OMRON



This Air Flow detector is specifically designed to detect clogged conditions in air filters on servers and other types of computer equipment. It adopts a velocity of the wind monitor employing an NTC thermistor to output 0 to 5V analog voltage signals. Output is via a 4 pin, Japan Aviation Electronic industry (JAE) IL-Z Series connector. Order Code 388-7443.

H = 33, W = 33, D = 9mm

Supply voltage	12V dc asd ± 10%	Operating Temperature	-25°C to +55°C
Current Consumption	60mA	Range of Detection	0.5 to 1.5m/sec.
Operating Humidity	25 to 85% RH		

418054

Mfrs. List No.	Order Code	1+	5+	10+
D6AN	100-7611	33.77	32.09	30.48

MEMS Flow Sensor
Dust ResistantOMRON
New

- Dust resistant design
- Incorporates the patent pending Dust Segregation System (DSS)
- 99.5% of dry airborne particulates separated
- Consistent air velocity measurement

Supply voltage - V dc	3.45
Current Consumption	15mA
Operating Humidity	Under 85% RH
Operating Temperature	-10°C to 60°C

H = 13, W = 8, D = 22mm

518055

Flow Range	Mfrs. List No.	Order Code	1+	25+	50+	100+
0 to 3m/s	D6F-V03A1	157-3149	20.86	19.13	17.39	15.65

Air Velocity Sensors
Uni-directional

OMRON



H = 9, W = 39, D = 20mm

These sensors are designed for the detection of clogged air intake filters and air velocity flows in office automation equipment, including consumer portable products such as PC projectors and other PC related peripherals, domestic products like Air Purifiers, coolers and many other more conventional HVAC products requiring to monitor airflow efficiency for product protection and environmental comfort. They may also be considered as a suitable alternative to single point Pitot tubes and Thermal dispersion sensors in heating ducts and building/ environmental management systems.

Inside each sensor is a highly sensitive MEMS flow chip that is only 1.5 square x 0.5 mm thick. The MEMS flow chip has two thermopiles either side of a tiny heater element used to measure the deviations in heat symmetry caused by the passing gas flow in either direction. A thin layer of insulating film protects the sensor chip from exposure to the gas. When there is no flow, temperature distribution concentrated around the heater is uniform. When a flow is subjected,



Pressure Sensors - continued

Air Velocity Sensors - continued

Uni-directional - continued

temperature on the side of the heater facing the flow cools and on the side away from the flow, warms up (heat symmetry collapses). This difference of temperature appears as a difference in the thermopile's electromotive force, the mass flow velocity and mass flow rate can be measured.

Supply voltage - V dc	Min. 10.8	Max. 26.4	Operating Humidity	Min.	Max. 85% RH
Current Consumption		15mA	Operating Temperature	-10°C	+60°C
Output voltage - V dc	0	5.7			

418081

Flow Range	Mfrs. List No.	Order Code	1+	5+	10+
0 - 1 m/sec.	D6FW-01A1	100-7615●	55.97	54.29	52.65
0 - 4 m/sec.	D6FW-04A1	100-7616●	55.97	54.29	52.65
Connecting Cable					
200mm	D6FW-CABLE	100-7617●	2.89	2.80	2.72

Differential Pressure Transducer
SDP1000 / SDP2000SENSIRION
THE SENSOR COMPANY

The Differential Pressure Transducer SDP1000/SDP2000 measures the mass flow caused by a differential pressure. Suppose that the gas is known and leakage is allowed smallest pressure differences can be reliably detected due to its outstanding characteristics based upon Sensirion's CMOSens™ technology.

- For cost sensitive OEM applications in HVAC
- Detects ultra low differential pressure
- Zero drift, offset & hysteresis free
- Outstanding accuracy and reproducibility (even below 10 Pa)
- Ultra fast response time
- CMOSens™ technology driven
- Fully calibrated & temperature compensated

H = 22, W = 30, L = 44
(incl. ports),
Port ctrs. = 16, Port dia. = 3.4,
Pin spacing = 2.54

- Not sensitive to mounting orientation
- Direct PCB mounting with simple snap-on system
- Linear or square root extracted output characteristics
- Analogue voltage output

		SDP1000			SDP2000			
Parameter		Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Measurement range		-20		500	-100		3500	Pa
Resolution	Linear output			0.2			0.9	Pa
	Square root			0.1			0.4	Pa
	extracted			0.5			1.5	Pa
	output			3			9	Pa
Repeatability			0.1			0.4		Pa
Media		Air, N ₂			Air, N ₂			
Response time			40			40		ms

Parameter	Condition	Min.	Max.	Units.
Accuracy / Linearity	@ 23°C / 73°F	-	0.5	FS
		-	3	%m.v.
Ambient temperature	Working	-10°C	60°C	°C
Power supply	DC	4.75	5.5	V
Operating current (max.)	VDD=5.0V, no load	-	5	mA
	VDD=5.0V, loaded	-	10	mA
Output voltage @ 0	RI=100kΩ	0.243	0.257	V dc
Output voltage @ FS	RI=100kΩ	3.93	4.07	V dc
Recommended load		10	∞	kΩ

Connecting tubes

Recommended inner diameter 3/16"

311245

Output	Mfrs. List No.	Order Code	1+	Price Each	10+	25+
Linear						
0.25 - 4.0V	SDP1000-L	120-7221●	51.08	47.09	43.19	
0.25 - 4.0V	SDP1000-L05	122-5681	114.51	107.97	103.60	
0.25 - 4.0V	SDP2000-L	120-7224●	41.88	39.98	38.25	
Square root						
0.25 - 4.0V	SDP1000-R	120-7223●	53.92	49.71	45.60	
0.25 - 4.0V	SDP2000-R	120-7225●	47.52	43.81	40.17	

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Differential Pressure Meter - ASP1400

SENSIRION
THE SENSOR COMPANY

The Differential Pressure Meter ASP1400 measures the mass flow caused by a differential pressure. Suppose that the gas is known and leakage is allowed smallest pressure differences can be reliably detected due to its outstanding characteristics.

- Detects ultra low differential pressure
- Zero drift & offset free
- Outstanding accuracy
- Ultra fast response time
- CMOSens™ technology driven
- Calibrated & temperature compensated
- Digital output signal (RS 232 & SPI)
- CE - certified

Measurement Range:	0.002 to 100 Pa (bi-directional)
Lowest detect. Press:	0.002 Pa
Resolution:	0.001 to 0.04 Pa
Reproducibility:	0.002 % full scale or 0.08 % measured value
Accuracy:	0.05 % full scale or 1.5 % measured value
Response time:	142 ms
Flow rate:	400 sccm @ 100 Pa
Max. overpressure:	2.0 bar
Operating temperature:	0 °C to 70 °C

Electrical Data	
Supply voltage range:	7 to 18 V
Input current:	20 mA @ 9 V (typical), 27 mA @ 9 V (max.)
Output signal:	RS 232 or SPI compliant

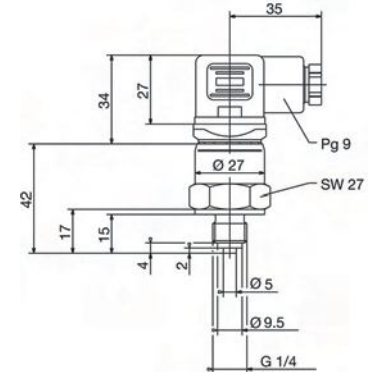
234888

Order Code	1+	Price Each	10+	25+
120-7218●	135.00	121.51	114.77	

Pressure Transducers and Transmitters

MIDAS Pressure transmitter
with monolithic ceramic sensor

JUMO



- long life thanks to excellent media compatibility (sensor technology and materials used)
- Compact design, especially for size-critical applications
- Stable temperature response ensures accurate measurements
- Favorable pricing through large-scale production
- Applications (examples) in: Refrigeration, Compressors, Building automation, Commercial vehicles

Technical Data:

Reference conditions	To DIN 16086 and IEC 770/5.3
Parts in contact with medium	Stainless steel, Mat. Ref. 1.4305, Viton (FPM), aluminium-oxide ceramic
Housing	Stainless steel, Mat. Ref. 1.4305, EPDM
Pressure Connection	G 1/4" to EN 837
Electrical Connection	Connector to DIN 43650
	Circular connector M12 x 1 IP67 to EN 60 529
Input	-1 bar to +60 bar
Output	4 - 20mA burden (U _b =10V)/0.02A
Supply Voltage	10 to 30 V dc
Zero Signal Deviation	<0.3% of full scale
Hysteresis	<0.2% of full scale
mechanical Shock	100g/1ms
Permissible temperature of medium	-30 to 125°C

333897

Type	Order Code	1+	Price Each	5+	10+
0...2.5 bar	472-3818	90.01	85.50	82.82	
0...10 bar	472-3820	90.01	85.50	82.82	
0...25 bar	472-3843	90.01	85.50	82.82	

Troubleshooting tips



Chat live online to one of our technical engineers at
www.farnell.co.uk

Transducers, Signal Conditioned Miniature

Honeywell


- Excellent liquid media compatibility
- Fully signal conditioned (4V output)
- 6 pin DIP package
- Operating temperature -40°C to +125°C
- Smallest amplified sensor package

H=19.1, W=11.2 (pin 30.9), D=13.2

The smallest fully signalled pressure transducer with excellent temperature stability. These 6 pin DIP gauge packages are available in pressure ranges from ± 50 mm Hg to 250 psi.

Pressure Range	Over Pressure	Null	Supply Current	Excitation	Hysteresis Repeatability	Mfrs. List No.	Order Code
± 50 mm Hg	170mm Hg	2.5V dc	10mA	5V dc ± 0.25	0.15% Span	40PC001B1A	310-7425
0 to 15psi	45psi	0.5V	10mA	5V dc ± 0.25	0.15% Span	40PC015G1A	310-7437
0 to 100psi	200psi	0.5V	10mA	5V dc ± 0.25	0.15% Span	40PC100G1A	310-7449
0 to 150psi	300psi	0.5V	10mA	5V dc ± 0.25	0.15% Span	40PC150G1A	310-7450
0 to 250psi	500psi	0.5V	10mA	5V dc ± 0.25	0.15% Span	40PC250G1A	310-7462

212421

Pressure Range	Order Code	1+	5+	10+	25+
± 50 mm Hg	310-7425	29.33	27.28	17.76	17.34
0 to 15psi	310-7437	29.33	27.28	26.71	26.14
0 to 100psi	310-7449	29.33	27.28	26.71	26.14
0 to 150psi	310-7450	29.33	27.28	26.71	26.14
0 to 250psi	310-7462	29.33	27.28	26.71	26.14

Transducers 5V Output - 140PC Series

Honeywell


- High level voltage output and complete calibration and temperature compensation
- For use with non-corrosive, non-ionic gases and liquids
- Differential devices can be used as gauge or differential sensors

Pins
1 Output
2 Ground
3 Supply+

L=59.8, W=30.0, D=18.5 (excl.pins)
Port O/D=5.00, Ctrs.=52.4.

Supply current Typ.	8mA	Operating temperature range	-40°C to +85°C
Supply current Max.	20mA	Storage temperature range	-55°C to +125°C
Current sourcing output	10mA	Response time	1.00ms

Operating	Linearity, B.F.S.L.		Repeatability		
Pressure	P2 ≥ P1	P2 ≤ P1	& Hysteresis		
Range	% Span		Sensitivity	% Span	Mftrs.
(psi)	Max.	Max.	(V/psi)	Typ.	List No.
0 to 15	---	±0.40	0.333	±0.15	142PC15A-PCB
0 to 1	±0.75	±0.40	5.000	±0.30	142PC01D-PCB
0 to 5	±1.50	±0.75	1.000	±0.25	142PC05D-PCB
					438-8045
					438-8033
					438-8069

310980

Operating Pressure	Order Code	1+	10+	25+
0 to 1	438-8033	94.38	74.49	70.28
0 to 15	438-8045	94.38	74.49	70.28
0 to 5	438-8069	94.38	74.49	70.28

Transducers, 0.5 - 4.5V Output Low Profile - HCX Series

SENSORTECHNICS


H=13, W=35, D=39
(including ports)
Pressure Port O/D=5

Connections
1 Voltage output
2 Internal connection
3 -V_s (GND)
4 Internal connection
5 +V_s
6 Internal connection

- Compensated, calibrated and amplified pressure transducers
- Small low-profile package with in-line pinning for easy PCB mounting
- Internal voltage regulation allows a calibrated output for a supply voltage ranging from 4.8 to 15V
- Suitable for measuring differential gauge and absolute pressures
- Designed for use with non-corrosive, non-ionic media eg. dry air and gases

Supply voltage	4.8V to 15V dc
Output	0.5 to 4.5V
Full scale output (FSO)	4.5V ± 50 mV
Operating temperature range	-10°C to +70°C
Linearity and hysteresis (BSL)	0.5% max
Zero pressure output	0.5V ± 50 mV
Thermal stability	0.2% FSO/°C (0°C TO +50°C) 0.12% FSO/°C (0°C TO +50°C) 0.10% FSO/°C (0°C TO +50°C)

RoHS ● Compliant
▲ Non-compliant



08447 11 11 11

at other pressures
Long term stability (1 yr)
Proof pressure
5-20 mBar devices
at 50/100/350 mBar
at 1 Bar and 5 Bar

0.05% FSO/°C (0°C TO +50°C)
 $\pm 0.20\%$ FSO typ.
350 mBar
1.40 Bar
2 rated pressure

212183

Operating Pressure	Mfrs. List No.	Order Code	1+	10+	25+
0 to ± 5 mbar	HCXPM005D6V	306-9540	82.37	75.78	69.19
0 to 10mbar	HCXM010D6V	306-9552	82.37	75.78	69.19
0 to ± 10 mbar	HCXPM010D6V	306-9564	82.37	75.78	69.19
0 to 50mbar	HCXM050D6V	540-638	82.50	75.90	69.30
0 to 100mbar	HCXM100D6V	540-640	82.50	75.90	69.30
0 to 350mbar	HCXM350D6V	540-651	82.50	75.90	69.30
0 to 1bar	HCX001D6V	540-663	63.64	58.55	53.46
0 to 1bar Absolute	HCX001A6V	540-687	57.28	52.70	48.11

Differential Transducers, 1 - 6V Output PTE5000 Series

SENSORTECHNICS


Connections
1 Brown +V_s
2 White V out
3 Blue Case
4 Black -V_s

Length=86 (without connector) Dia.=40,
Pressure ports 1/8" BSP female

- Temperature compensated differential transducer
- Rugged aluminium casing offering environmental protection to IP67
- Applications include flow measurement and filter monitoring in harsh conditions
- Designed for use with non-corrosive, non-ionic, media eg. dry air and gases

Reference conditions	V _S = 15V, T (ambient) = 25°C, R load = 100K Ω common mode pressure = 0 psi		
Output voltage	1 to 6V		
Supply voltage	12 to 32V		
Offset voltage	1V \pm 100mV		
Span	5.0V \pm 100mV		
Power consumption	60mW (typ.)		
Response time	(10-90%) 0.1ms		
Operating Pressure	Proof Pressure	Mfrs. List No.	Order Code
0 to 50sid (a)	20 psi	PTE5005D1A	678-521

222140

Operating Pressure	Order Code	1+	10+	25+
0 to 5psid (g)	678-521	157.68	149.79	141.90

Transducers & Transmitters - PTE2000 Stainless Steel Housing

SENSORTECHNICS


Dia = 31.8mm (25.4 across flats), Fitting
3/8" NPT
L = 62mm (body excl. connector), Cable
L = 2m

- Fully temperature compensated and signal conditioned gauge pressure transducer
- 4 to 20mA output
- Rugged stainless steel housing
- Designed for the measurement of hostile media in harsh environments
- 12 to 36V dc supply voltage
- Internal voltage regulator allows use of unregulated power sources
- Right-angle plug-in connector gives protection to IP67 and reduces installation and maintenance time

Operating Pressure Range	Proof Pressure	Burst Pressure	Mfrs. List No.	Order Code
0 to 5psig	20	1000 psig	PTE2005G4A.	704-9109
0 to 15psig	30	1000 psig	PTE2015G4A	678-600
0 to 30psig	60	1000 psig	PTE2030G4A	678-612
0 to 100psig	200	5000 psig	PTE2100G4A	678-624

222176

Operating Pressure	Order Code	1+	10+	25+
4 to 20mA Output				
0 to 5psig	704-9109	201.83	191.73	181.64
0 to 15psig	678-600	201.83	191.73	181.64
0 to 30psig	678-612	201.83	191.73	181.64
0 to 100psig	678-624	201.83	191.73	181.64

Compact Silicon Diaphragm Transmitters CTE7000 Series

SENSORTECHNICS


L=72 Dia=21.8 Thread=1/8" BSP Male

- 0 to 25mBar to 0 to 7 Bar ranges
- Field interchangeable
- Choice of 0 to 5V or 4 to 20mA outputs
- Absolute or Gauge pressures available

The CTE7000 series is a compact silicon diaphragm transmitter, offering a low cost solution for air and dry inert gas applications. This family of sensors offers a choice of electrical outputs and process connections.

- Rugged stainless steel construction
- Applications include Pneumatic control, medical and instrumentation

14

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527

Pressure Transducers and Transmitters - continued

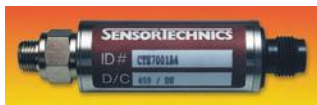
Compact Silicon Diaphragm Transmitters CTE7000 Series - continued

	1 to 5 V	4 to 20mA
Supply Voltage	9 to 32 Vdc	9 to 32 Vdc
Full Scale Output	5 Vdc (±50mV) CTE7N±2.5V (±50mV)	16mA (±0.2mA) ±8mA (±0.2mA)
Zero Pressure Output	0 Vdc (±50mV) CTE7N±2.5V (±50mV)	4mA (±0.2mA) 12mA (±0.2mA)
Operating Temperature	-40°C to 85°C	
Response Time	1 ms	

249431

Operating Pressure	Mfrs. List No.	Order Code	1+	10+	25+
Gauge, 4 to 20mA Output					
0 to 70mbar G	CTE70070GY4	419-7689	110.65	105.62	100.59
Gauge, 0 to 5V Output					
0 to 350mbar G	CTE70350GY7	419-7781	110.65	105.62	100.59
0 to 5bar G	CTE7005GY7	419-7823	110.65	105.62	100.59

Compact Ceramic Diaphragm Transmitters CTE8000 Series



L=72 Dia=21.8 Thread=1/8BSP Male

- 0 to -1Bar to 0 to 100 Bar ranges
- For many industrial gases and liquids
- Field interchangeable
- Choice of 0 to 5V or 4 to 20mA outputs
- Gauge pressure sensing
- Rugged stainless steel construction
- Applications include Pneumatic contro and instrumentation

The CTE8000 series is a compact ceramic diaphragm transmitter, offering a low cost solution for many industrial gases and liquids. This family of sensors offers a choice of electrical outputs and process connections.

	1 to 5 V	4 to 20mA
Supply Voltage	9 to 30 Vdc	9 to 30 Vdc
Full Scale Output	5 Vdc (±50mV)	16mA (±0.2mA)
Zero Pressure Output	0 Vdc (±50mV)	4mA (±0.2mA)
Operating Temperature	-40°C to 100°C	
Response Time	10 ms	
Proof Pressure	2 x rated pressure	

249441

Operating Pressure	Mfrs. List No.	Order Code	1+	10+	25+
Gauge, 4 to 20mA Output					
0 to 10bar G	CTE8010GY4	419-7884	77.07	77.02	74.99
0 to 50bar G	CTE8050GY4	419-7902	77.07	70.91	64.74
Gauge, 0 to 5V Output					
-1 to +1bar G	CTE8N01GY7	419-7938	77.07	70.91	64.74
0 to 10bar G	CTE8010GY7	419-7963	77.07	70.91	64.74

Transducers & Transmitters - BTE6000 Stainless Steel, Flush Diaphragm and High Pressure



High Pressure
H = 35, W = 48, D = 160
(including connector)
Dia. = 27, Thread = 1/2" BSP

Flush
H = 35, W = 48, D = 135
(including connector)
Dia. = 27, Thread = 1/4" BSP

- Pressures up to 350 bar
- Flush mount versions
- Designed for use with any corrosive or non-corrosive media compatible with 303 stainless steel
- 1 to 6V and 4 to 20mA outputs
- Field interchangeable
- Protected against reverse polarity and sealed to IP65
- Suitable for harsh environments
- Flush diaphragm type transducers avoid the problem of particulate build up and minimise dead volume
- Flush diaphragm types are particularly suitable in the food industry and applications using thick liquids and semi-solids

Fully temperature compensated, signal conditioned transducers offering flush mounted stainless steel diaphragms for gauge and absolute pressure and DIN standard 'manometer thread' versions for high pressure.

Connections	
1 - 6V output	4 - 20mA output
1 +V _s	1 +V _s
2 -V _s	2 -V _s
3 V out	3 NC
≠ case	≠ case

	1 to 6V Output	4 to 20mA Output
Supply voltage	12 to 30V dc	12 to 36V dc
Zero offset	1.0V ± 150mV	4.0mA ± 150µA
Full scale span	5.0V ± 100mV	16.0mA ± 100µA
Operating temperature	-40°C to +100°C	
Linearity and hysteresis	± 0.2% FSO nom.	

Repeatability
Thermal stability (0 to +70°C)
Long term stability (1 year)
Proof pressure
FSO = Full Scale Output

1 to 6V Output
± 0.1% FSO nom.
0.05% FSO/°C
± 0.2% FSO
2 rated pressure

Operating Pressure	1 to 6V Output Mfrs. List No.	Order Code	4 to 20mA Output Mfrs. List No.	Order Code
Flush diaphragm style				
0 to 1 Bar A			BTE6001A4-FL	678-697
0 to ±1bar G	BTE6N001G1-FL	678-650	BTE6N001G1-FL	678-703
0 to 5bar G			BTE6005G4-FL	678-715
0 to 10bar G			BTE6010G4-FL	678-727
0 to 16bar G			BTE6016G4-FL	678-739
High pressure style				
0 to 35bar A			BTE6035A4	700-9021

212181

Operating Pressure	Order Code	1+	10+	25+
Voltage Output				
0 to ±1bar G	678-650	211.74	201.14	190.56
Flush Diaphragm, 4 to 20mA Output				
0 to 1bar A	678-697	211.74	201.14	190.56
0 to ±1bar G	678-703	211.74	201.14	190.56
0 to 5bar G	678-715	211.74	201.14	190.56
0 to 10bar G	678-727	211.74	201.14	190.56
0 to 16bar G	678-739	211.74	201.14	190.56
0 to 35bar A	700-9021	211.74	201.14	190.56

Barometric Pressure Transducer



Connections:
1 +V_s H=32 (including ports)
2 GND W=30, D=60
3 V_{out} Fixing centres 52.4mm, 3.5mm dia.



- Transducer covers barometric pressures 800mBar to 1100mBar
- Calibrated and signal conditioned 0 to 5V output
- Applications in barometry, weather stations, absolute pressure compensation in sensitive equipment

The transducer provides a true 0 to 5V output over the barometric pressure range. Internal voltage regulation allows the device to operate from a single rail power supply between 7 and 24V. A potentiometer is provided to adjust for changes in altitude. The transducer is designed for use with non-corrosive, non-ionic media eg. dry air and gases.

Reference conditions	V _s = 8V, T (ambient) = 25°C, RL = 100KΩ
Supply voltage	7 to 24V dc
Operating pressure	800 to 1100mbar
Proof pressure	2 bar
Voltage output (span)	5V± 500mV
Operating temperature	-40°C to +85°C
Compensated range	-10°C to +60°C
Non-linearity and hysteresis	0.1% FSO (max.)
Repeatability	0.2% FSO (typ.)
Temperature shift (-10°C to +60°C)	0.3% FSO/10°C (max)
Response time	1ms (typ.)
Long term stability	0.1% FSO (typ.)

Mfrs. List No. 144SC0811-BARO

212180

Operating Pressure	Order Code	1+	10+	25+
800 to 1100mbar	540-894	130.14	124.22	118.31

Very Low Pressure Differential Transducers Signal Conditioned - 160PC Series



L=59.8, W=30.0, D=33.7
(excl. pins)
Pressure port O/D=5.0
Fixing centres=52.4

Pins:
1. OUT,
2. GND,
3. IN+

Supply voltage	8V dc (nom.), 6V dc (min.), 16V dc (max.)
Supply current	20mA max.
Null offset	1.0 ± 0.05V (162/164PC), 3.50 ± 0.05V (163PC)
Output at full pressure/vacuum	6.0 ± 0.1V (162/164PC), 1.0 ± 0.2V (163PC)
Span	5V
Ratiometric error	7-8V and 8-9V ±0.5% span, 9-12V ± 2.0% span
Repeatability and hysteresis	±0.25% span (162 type ±0.15% span)
Temperature range	-40°C to +85°C (-18°C to +63°C compensated)
Media	Port 2: wetted compatible with polyester housing, epoxy adhesive, silicon, borosilicate glass and silicon-to-glass bond.

- High sensitivity pressure transducers enabling pressures as low as 0 to ±2.5" H₂O to be measured
- Transducers are temperature compensated and fully signal conditioned, with calibrated null and FSO

Utilising the latest silicon technology, a higher sensitivity and lower null shift is achievable. Higher sensitivity requires less amplification and improves the signal to noise ratio.

212247

Operating Pressure	Mfrs. List No.	Order Code	1+	5+	10+	25+
0 to 28" H ₂ O	162PC01D	731-857	107.01	99.54	92.58	86.12
0 to 10" H ₂ O	164PC01D37	731-870	87.55	81.43	75.75	70.46
0 to ±2.5" H ₂ O	163PC01D75	731-882	87.55	81.43	75.75	70.46
0 to 5" H ₂ O	164PC01D76	731-894	87.55	81.43	75.75	70.46

Miniature Transducers and Transmitters

Stainless Steel — 0-100mV/0-5Vdc/4-20mA Output — 21R Series



Body L = 76 (excl. connector),
Dia = 17. Fitting = G1/4
(1/4" BSP) male port

Signal output	0-100mV $\pm 0.1\%$	0-5V dc $\pm 1\%$	4-20mA $\pm 1\%$
Zero balance	$\pm 0.1\%$	1%	1%
Supply	8-28V dc unregulated (4 wire)	8-28V dc (3 wire)	8-28V dc (2 wire)
Non-linearity and hysteresis	0.2% max.	0.5% max.	0.5% max.
Total error band*	2.5 max.	2.5% typ., 4% max.	2.5% typ., 4% max.
Operating temperature	-20°C to +80°C	-20°C to +80°C	-20°C to +80°C
Over-pressure	2 range or 1100 bar, whichever is less		

*Total error band includes hysteresis, zero and span effects, temperature effects and repeatability

212335

Output	0-5Vdc	4-20mA	1+	Price Each	5+	10+
Pressure Range						
0 to 2.5bar G	709-9472	710-0723	107.19	104.89	92.91	
0 to 10bar G	709-9484	710-0735	107.19	104.89	92.91	
0 to 25bar G	709-9496	710-0747	107.19	104.89	92.91	
0 to 250bar G	709-9514	710-0760	107.19	104.89	92.91	
0 to 400bar G	709-9526		107.19	104.89	92.91	
0 to 1bar A	709-9540	710-0796	147.67	142.82	124.24	
0 to 2.5bar A	709-9551		147.67	142.82	124.24	

Transducers & Transmitters

3296/3396 Series



Output signal
Accuracy
Reproducibility
Hysteresis
Temperature compensation
Temperature range medium
Temperature range ambient

Pressure sensor suitable for both industrial and OEM-type applications due to its low cost, light weight and high accuracy.

- Economical industrial design
- Transmitter (4-20mA output) and transducer (0-10V output) types
- Accuracy 1% of full scale value
- Stainless steel construction
- Industrial standard DIN 43650 connector
- 1/4" BSP connection
- 4 to 20mA (2-wire) or 0 to 10V dc (3-wire)
- 1% of full scale value
- $\leq \pm 0.2\%$ of full scale value included in accuracy
- 0°C to +80°C
- -40°C to +100°C
- -30°C to +80°C

224671

Pressure Range	Mfrs. List No.	Order Code	1+	Price Each	5+	10+
4 - 20mA Output						
0 to 1bar	3296069001	705-6412	106.49	103.50	95.05	
0 to 2.5bar	3296072001	705-6424	106.49	103.50	95.05	
0 to 10bar	3296075001	705-6436	106.49	103.50	95.05	
0 to 25bar	3296078001	705-6448	116.46	113.19	103.95	
0 to 100bar	3296081001	705-6450	116.46	113.19	103.95	
0 to 250bar	3296084001	705-6461	112.52	109.36	100.44	
0 to 1000bar	3296088001	705-6473	116.46	113.19	103.95	
0 - 10mA Output						
0 to 10bar	3296075101	705-6503	106.49	103.50	95.05	
0 to 100bar	3296081101	705-6527	141.40	137.46	126.20	
0 to 1000bar	3296088101	705-6540	144.23	140.20	128.73	

Transducers, 50mV Output

Stainless Steel Housing - MM Series



L=70 (including connector) Dia.=25.4
Fitting: Port with 1/8" BSP (parallel) thread 14mm hex. nut
Connections: 1 +Signal 2 -Supply 3 -Signal 4 + Supply

Excitation voltage	dc recommended (6.0V dc maximum)
Span	50 ± 1 mV dc
Zero balance	± 2.5 mV dc @ 25°C
Non linearity/repeatability and hysteresis	\pm FSO from best fit straight line to (with connector)
Operating temperature range	-1°C to 80°C
Compensated temperature range	$\leq \pm 1$ FSO (any 55°C over comp. range)
Thermal effect on zero	

Honeywell

Thermal effect on span
Proof pressure

$\leq \pm 1\%$ reading (any 55°C over comp. range)
2 rated range without damage (0-15,25,50,100,200 psig)
1.5 rated range without damage (0-500,1000,2000,5000 psig)
10 rated range without bursting (0-15,25,50,100,200 psig)
5 rated range without bursting (0-500,1000,2000,5000 psig)

212211

Operating Pressure	Mfrs. List No.	Order Code	1+	Price Each	10+	25+
0 to 100psig	MM10013	615-754	146.51	139.19	131.87	

Transducers, 5V Output



Connections
1 Ground
2 No connection
3 Signal output
4 Supply voltage

H=38.1, W=54.6, D=41.9,
Fixing centres=41.9mm

Pressure connections: 1/8" NPT threaded port

- Rugged OEM style gauge pressure transducers, fully calibrated and temperature compensated
 - Stainless steel pressure chamber design ensures circuit protection from corrosive media
 - Valox outer case protects against harsh environments
 - Typical media include water, oil, gases, hydraulic fluids, alcohol, acids and petrol
 - Valox connector with crimp pins supplied
- | | | | |
|------------------------|-----------------------|----------------------|------------------------------|
| Supply voltage V_s | 8V to 20V dc | Zero pressure output | 1.0V dc ± 0.15 V dc max. |
| Output | 5V ± 100 mV | Stability (1 year) | $\pm 1.0\%$ FSO typ. |
| Span | 1V to 6.0V dc | Proof pressure | |
| Operating temperature | -55°C to +125°C | EA50, EA100, EA200 | 2 rated op pressure |
| Linearity | $< \pm 0.5\%$ FSO | EA500 | 1.5 rated op pressure |
| Hysteresis | $\pm 0.25\%$ FSO typ. | Burst pressure | |
| Shift with temperature | 0°C to 85°C | EA50, EA100, EA200 | 10 rated op pressure |
| | -55°C to +125°C | EA500 | 5 rated op pressure |
| | | | |

212381

Operating Pressure	Mfrs. List No.	Order Code	1+	Price Each	10+	25+
0 to 100psig	EA100	415-145	301.88	286.78	271.69	

Transducers, 5V Output

Stainless Steel Housing



- Fully signal conditioned and temperature compensated transducers
- Rugged stainless steel housing with stainless steel isolated diaphragm, shielded connector cable
- Male pressure connection has a self-sealing thread
- Typical media include oil, gases, aqueous solutions, hydraulic fluids, alcohol, freon, ammonia, acids and petrol
- Suitable for pressure applications that involve measurement of corrosive media in harsh environments

Connections
Red — Supply Voltage
Brown or white — Signal output
Black — Ground

L=48 (excl. cable), Dia=39, Mounting=1/2" hex,
Thread=1/8"-27 NPT, Cable length = 1000

The low pressure devices, up to 50 psi, are absolute devices. The higher pressure devices are sealed gauge, i.e. sealed at atmospheric pressure in manufacture.

Reference, V_s	9V	-55°C to +125°C	0.02% FSO/°C typ
Output	5V	Zero pressure output	1.0V dc ± 0.15 V dc max
Span	1V to 6V dc	Stability (1 year)	$\pm 1.0\%$ FS output
Supply voltage	9V to 20V dc	Proof pressure	
Operating temp range	-55°C to 105°C	SA15A, SA25A, SA50A	2 rated op pressure
Linearity	$< \pm 1\%$ FSO for SA15A, SA25A	SA100S, SA200S	2 rated op pressure
	$< \pm 0.5\%$ FSO for others	SA1000S to SA5000S	1.5 rated op pressure
Hysteresis	$\pm 0.25\%$ FSO typ	Burst pressure	
Shift with temperature	0°C to +85°C	SA15A, SA25A	20 rated op pressure
		SA50A, SA100S, SA200S	10 rated op pressure
		SA1000S to SA5000S	5 rated op pressure

212403

Operating Pressure	Mfrs. List No.	Order Code	1+	Price Each	10+
0 to 15psia	SA15A	415-182	239.65	227.67	
0 to 25psia	SA25A	415-194	239.65	227.67	
0 to 50psia	SA50A	415-200	239.65	227.67	
0 to 100psia	SA100S	415-212	190.83	185.92	

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14



Pressure Switches

Sensitive Pressure Switches



Sensitive, pressure, vacuum and differential pressure measurement switches, housed in a glass filled polyester case.

- Externally adjustable
- Can be mounted in any orientation
- Suits a wide variety of applications
- **UL** and **CSA** recognised

Series 1: Adjustable miniature pressure, vacuum and differential switch for air measurement

Series 2: Gauge pressure only, supplied with 4 colour coded springs, 1 fitted, to cover pressure ranges from 0.07 bar and full setting instructions

	Series 1	Series 2
Case Material	Glass filled polyester	Glass filled polyester
Electrical	SPST Momentary NO	SPDT (N/O or N/C)
Contact Rating	20 mA, 250 Vac	5 A, 250 Vac
Fluid Medium	Air / Gases	Wide range of Media
Burst Pressure	1.75 Bar	3.1 Bar
Mechanical Life	10 ⁹	10 ⁶
Operating Temperature	-40°C to 120°C	-40°C to 85°C
Contact Material	Phosphor Bronze / 18 ct Gold	Phosphor Bronze / 18 ct Gold
Diaphragm	Polyurethane	Polyurethane
Weight	10g	18g
Mounting	Lugs or pressure stub	Lugs or pressure stub

249526

Pressure Range	Mfrs. List No.	Order Code	1+	5+	10+
Series 1					
25 to 125mbar	6101-0021	427-6530	20.16	18.81	17.99
0.25 to 1.35bar	6101-0019	427-6553	20.16	18.81	17.99
Series 2					
0.025 to 2.75bar	6101-0018	427-6565	20.61	19.21	18.39

Miniature Medium Pressure Switches



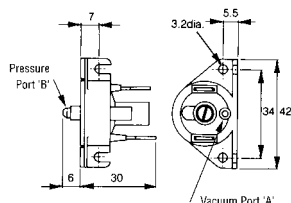
Miniature pressure switch with all die cast housing and integral 1/8 NPT connection. The switch is designed for moderately high pressure with external vernier adjustment screw.

The switch can be mounted in any orientation to suit a wide variety of applications. **UL** and **CSA** recognised. Supplied with 4 colour coded springs, 1 factory fitted, to cover pressure ranges from 0.7 bar to 16 bar and full setting instructions.

Case Material	Die Cast	Mechanical Life	10 ⁶
Electrical	SPST Momentary (NO or NC)	Operating Temperature	-40°C to 85°C
Contact Rating	5 A, 250 Vac	Diaphragm	Polyurethane
Fluid Medium	Wide range of media	Weight	57g
Burst Pressure	34 Bar		

249528

Pressure Range	Mfrs. List No.	Order Code	1+	5+	10+
0.7 to 16bar	6101-0016	427-6577	19.97	18.63	17.83

Low Pressure 1" - 16" H₂O

- Miniature pneumatic switch for very sensitive pressure, vacuum and differential pressure switching
- Housed in a glass filled nylon 12 surface mounting body with neoprene diaphragm
- Switch can be set for normally open or normally closed operation
- Sensitivity can be adjusted from 1" to 16" H₂O
- Supplied with 1 metre of PVC connecting tube
- Air bleed version has adjustable air bleeds on both sides of the diaphragm

herga

Pressure/Vacuum range

25mm (2") H₂O (min),
400mm (16") H₂O (max/max. differential)
50mm (2") H₂O (Contact normally open)
0.34 Bar (5 psi) max.
1.0 Bar (14.7 psi)
-5°C to +50°C
SPST N/O, N/C
Contact rating
5mA, 250V ac (resistive)
Contact resistance
50mΩ
Pressure connections
4mm dia. spouts

212230/406081

Type	Mfrs. List No.	Order Code	1+	10+	25+	50+
Standard	6753-00	731-912	25.85	23.62	22.44	21.13
Air Bleed	6753-0F	723-0497	25.78	23.53	22.35	21.06

Vacuum Switch

75" to 270" H₂O

- Robust low vacuum switch suitable for industrial applications
- Pressure fully adjustable on increasing vacuum
- Suitable for use with butane, compressed air, water, mineral and fuel oils, citric acid, etc.

H=38, Dia.=43,
Fixing holes=5 to suit No. 4 self-tap screws

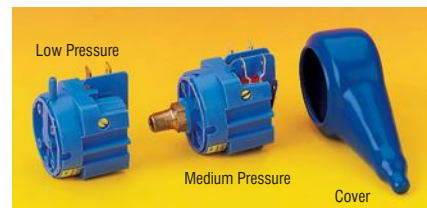
Pressure range (on increasing vacuum) 1900 to 6860mm H₂O (75" to 270" H₂O)
Electrical switch SPCO 21(8)A 250V ac
Vacuum connection Side entry spout 4mm O/D
Temperature range -5°C to +70°C
Materials Nylon 12 body, neoprene diaphragm
Spring (in vacuum cavity) Spring steel

FOR SUITABLE PLASTIC PROTECTIVE COVER ORDER CODE **723-0485**

222172

Mfrs. List No.	Order Code	1+	10+	25+	50+
6721-40	723-0448	25.74	22.75	21.78	20.62

Low/Medium Pressure

5 to 25" H₂O, 3 to 5.5 psi, 8 to 18 psi

Low pressure: H=38, Dia.=43, Fixing holes=5 to suit No. 4 self-tap screws
Medium pressure: H=38 (body), 58 (overall), W=40, D=43,
Fixing holes=4 to suit No. 4 self-tap screws

- Robust pressure switches suitable for industrial applications
- Pressure fully adjustable throughout range
- All types suitable for use with butane, compressed air, water, citric acid, etc.
- Low pressure types also suitable for use with mineral and fuel oils, detergent solution, etc.
- Plastic cover available to protect electrical terminals

Pressure range	Low pressure type: 127 to 635mm water gauge (5" to 25" water gauge)
	Medium pressure type: 3 to 5.5psi (0.20 to 0.37 Bar)
	types: 8 to 18psi (0.54 to 1.22 Bar)
Electrical switch	Low pressure type: SPCO 10(3)A 250V ac
	Medium pressure type: DPCO 21(8)A 250V ac
Pressure connection	Low pressure type: Side Entry Spout 4mm O/D
	Medium pressure types: 1/8" BSPT brass
Temperature range	-5°C to +70°C
Materials	Nylon 12 body, neoprene diaphragm, steel spring

212380

Pressure Range	Mfrs. List No.	Order Code	1+	10+	25+	50+
Low Pressure						
5" to 25" water gauge	6731-06	723-0450	17.44	15.42	14.74	13.97
Medium Pressure						
3 to 5.5psi	6742-30	723-0461	28.50	25.22	24.14	22.84
8 to 18psi	6742-50	723-0473	27.89	24.68	23.61	22.35
Plastic Protective Cover	6819-01	723-0485	1.77	1.59	1.52	1.42

Industrial



Connections
1. Common
2. N.C., opens on pressure rise
3. N.O., closes on pressure rise

H=130, W=82, D=38
Fixing centres
(2 holes dia.=4)=45x69, Pressure input= 1/4" BSP brass

herga

- Pressure switching can be set externally
- Switching hysteresis between rising and falling pressure can be preset
- Double insulated GFS nylon housing, sealed to **IP65**
- Pressure setting can be made tamper-proof by 1.5mm A/F Hex. key
- Approximate pressure setting may be seen through a window in the cover

Industrial pressure switch supplied with 3 colour coded springs to give 3 pressure ranges covering 20 psi to 200 psi, the mid-range spring being supplied ready fitted. Switching is through two separate SPCO V3-style microswitches with $\frac{1}{4}$ " fast-on spade connections, and cable entry is via M20 tapped conduit hole.

Brass and nitrile rubber are the only materials in contact with the pressure system, making the pressure switch suitable for most commonly used operating fluids, for example in regulating water flow lines or in factory air systems.

Operating pressure ranges (on rising pressure)	Red spring: 20 to 50 psi (1.4 to 3.5 bar) White spring: 40 to 100 psi (2.7 to 6.9 bar) Blue spring: 80 to 200 psi (5.5 to 13.8 bar)
Switching hysteresis	Adjustable 20% to 50% of operating pressure
Switch setting accuracy	± 2 psi @ 50 psi rising pressure
Withstand pressure	500 psi
Contact rating	15A 250V ac (resistive)
Operating temperature	-5°C to +70°C

212426

Mfrs. List No.	Order Code	1+	10+	50+
6702-0002	213-317	41.09	37.46	35.32

Extended Duty Pressure Switch 5000 Series



- $\frac{1}{8}$ -27 NPT male thread
- $\frac{1}{4}$ " blade terminals with 8-32 screws
- Plated steel base
- Glass reinforced polyester cover
- Direct action blade contact
- Silver alloy contact, gold plated

The 5000 Series switch is specifically designed to stand up to demanding pressure applications. The switch is factory set but capable of customer adjustment. It features a Kapton diaphragm for compatibility with a wide variety of fluids.

Dia. = 37.34mm (1.47"), H = 58.42mm (2.3")

Contact rating - Resistive	15A @ 6V dc, 4A @ 24V dc
Contact rating - Inductive	1A @ 120V ac, 0.5A @ 240V ac
Proof pressure	500 psi
Burst pressure - 4 to 15 psi Set pressure range	750 psi
Burst pressure - 35 & 60 psi Set pressure range	1250 psi
Temperature range	-40 to 250°C

510969

Pressure Pre-set	Range	Mfrs. List No.	Order Code	1+	5+	10+
4psi	3.1 to 7psi	76575	160-5366	25.53	22.97	21.27
4psi	3.1 to 7psi	76577	160-5368	28.24	25.41	23.54
10psi	8 to 13psi	76576	160-5369	24.14	21.72	20.12
10psi	8 to 13psi	76578	160-5370	30.41	27.36	25.35
15psi	14 to 24psi	76052	160-5371	25.28	22.76	21.07
15psi	14 to 24psi	76062	160-5372	30.06	27.06	25.05
35psi	25 to 50 psi	76053	160-5373	25.75	23.17	21.47
35psi	25 to 50 psi	76063	160-5374	32.12	28.91	26.77
60psi	51 to 90psi	76054	160-5375	26.19	23.57	21.82
60psi	51 to 90psi	76064	160-5376	32.12	28.91	26.77

Industrial - 0184 Series



L=90 (overall), Dia.=34,
Mounting=27 hex., Thread= G $\frac{1}{4}$
($\frac{1}{4}$ " BSP)

- EPDM seal material type suitable for use with water, hydrogen, sea water, acetylene
- Stainless steel body versions suitable for process and chemical industries and pharmaceutical, agricultural applications etc.

Output Rating	4A	Mechanical Life	1000000 operations
Maximum operation	200 operations/min	Temperature range	-30°C to +100°C
Hysteresis	10%	Body Material	Zinc plated steel
Adjustment Range	Tolerance at Room Temp.	Over Pressure	
0.3 to 1.5bar	± 0.2 bar	100bar	
1 to 10bar	± 0.5 to 1.0 bar	300bar	
10 to 50bar	± 3.0 bar	300bar	
10 to 100bar	± 3.0 to 5.0 bar	300bar	
50 to 200bar	± 5.0 bar	600bar	

212264

Honeywell

New

Soco

Operating Pressure Range	Mfrs. List No.	Order Code	1+	5+	10+
Zinc Plated Steel Body, NBR Diaphragm					
0.3 to 1.5bar	0184-45703-1-003	679-057	41.21	40.38	37.82
1 to 10bar	0184-45803-1-042	679-069	41.21	40.38	37.82
10 to 50bar	0184-45903-1-009	679-070	41.20	40.37	37.81
10 to 100bar	0184-46103-1-012	679-082	41.21	40.38	37.82
50 to 200bar	0185-46003-1-003	679-094	44.94	44.05	41.27
Zinc Plated Steel Body, EPDM Diaphragm					
0.3 to 1.5bar	0184-457032-003	721-3086	41.21	40.38	37.82
1 to 10bar	0184-458032-042	721-3098	41.21	40.38	37.82
10 to 50bar	0184-459032-009	721-3104	41.21	40.38	37.82
Stainless Steel Body, NBR Diaphragm					
0.5 to 5bar	0184-457031-SS	721-3037	56.09	54.97	51.50
1 to 10bar	0184-458031-SS	721-3049	56.09	54.97	51.50
10 to 50bar	0184-459031-SS	721-3050	56.09	54.97	51.50
10 to 100bar	0184-461031-SS	721-3062	56.09	54.97	51.50

Load Cells

Single Point, Aluminium, 3-50Kg (30-500N)

5/10/20/50/100kg

TEDEA
HUNTLEIGH
EXCELLENCE IN LOAD CELLS

1022



1040

- Off-centre loading capability
- Easy to mount and use
- Versatile for use in test equipment
- Ideal for supporting weighing platforms
- High sensitivity and high accuracy

Low profile, aluminium single-point load cells, with industry standard mounting dimensions. Off-centre loading capability allows ease of use in force measurement applications or for weighing platforms.

Rated capacity in Kg	3/5/10/20/50	Kg
Rated capacity in Newtons (approx.)	30/50/100/200/500	N
Output at rated capacity	2.0 to $\pm 0.2\%$	mV/V
Total errors	0.02	% of applied load
Temperature range: operating	-30 to +70	°C
Temperature range: compensated	-10 to +40	°C
Safe overload	150	% of rated capacity
Ultimate overload	300	% of rated capacity
Excitation: recommended	10	Volts AC or DC
Excitation: maximum	15	Volts AC or DC
Input impedance	415 \pm 15	ohm
Output impedance	350 \pm 3	ohm
Deflection at rated capacity	≤ 0.4	mm
Threaded mounting holes	M6x1.0	4 Places
Environmental protection	1022 Series = IP66, 1040 = IP54	
Cable types	1022 Series = 4-Wire 1040 = 6-Wire	4 Wire, PVC, Single Floating Screen
Cable length	1022 Series = 0.5, 1040 = 1	m
Maximum platform size	1022 Series = 350 x 350, 1040 = 400 x 400	mm
Dimensions L x W x H	725-6139, 725-6140 10x25x22 725-6152, 725-6164 130x30x22 700-0911: 150x29.4x40	mm

224684

Capacity	Mfrs. List No.	Order Code	1+	5+	10+
3kg	1022M-3M-F-106	725-6139	104.19	96.90	91.69
5kg	1022M-5M-F-106	725-6140	130.24	121.13	114.62
10kg	1022M-10M-F-106	725-6152	130.24	121.13	114.62
20kg	1022M-20M-F-106	725-6164	130.24	121.13	114.62
50kg	1040M-50M-F	700-0911	180.16	167.56	158.54

'S' Type, Tension/Compression

250-1000 Kg (2.5 - 10KN)

TEDEA
HUNTLEIGH
EXCELLENCE IN LOAD CELLS

601/616



620

- Designed for tension or compression operation
- Versatile and adaptable
- Compact, rugged designs
- Simple to mount and use
- Rod-end bearings available

Designed to tolerate either tension or compression forces, 'S' type load cells are easy to mount and use. The threaded mounting holes allow easy adaptation to force measurement applications such as pneumatic/hydraulic actuators, and the self-aligning capability when used with rod-end bearings results in high accuracies, suitable for mechanical scale conversions or reaction torque measurements.

Rated capacity in Kg	250	500	1000	kg
Rated capacity in Newtons (approx.)	2500	5000	10000	N
Output at rated capacity	2.0 \pm 0.1%	2.0 \pm 0.1%	2.0 \pm 0.1%	mV/V
Total error	0.025	0.03	0.025	% of applied load
Operating temp. range	-30 to +70	-30 to +70	-30 to +70	°C
Compensated temp. range	-10 to +40	-10 to +40	-10 to +40	°C



Load Cells - continued

'S' Type, Tension/Compression - continued

250-1000 Kg (2.5 - 10KN) - continued

Safe overload	150	150	150	Capacity % of rated
Ultimate overload	300	300	300	Capacity % of rated
Excitation: recommended	10	10	10	V ac or dc
Excitation: maximum	15	15	15	V ac or dc
Input impedance	415±15	385±15	400±20	ohms
Output impedance	350±3	350±3	350±3	ohms
Deflection at rated capacity	<±0.4	<±0.4	<±0.4	mm
Environmental protection	IP65	IP67	IP68	
Cable type	4 Wire, PVC, Single Floating Screen		6 Wire, Polyurethane Dual Floating Screen	
Cable length	3	3	5	m
Dimensions L x W x H	70 x 34 x 76	62 x 26 x 80	70 x 32 x 90	mm
Threaded mounting holes	M12 x 1.75	1/2" 20 UNF	M16 x 2.0	2 places
Mfrs. List No.	641-300M-D2	616-500U-F	620-1000M-F	
Order Code	704-3820	704-3831	704-3843	

213401

	Capacity	Order Code	1+	5+	10+
Load Cells	250kg	704-3820	260.49	234.44	221.42
	500kg	704-3831	251.88	240.58	227.20
	1000kg	704-3843	325.60	293.04	276.76

Accelerometers

Acceleration/Vibration Sensing



Piezo-Electric Accelerometers

These units have a crystal of piezo-electric material to which is attached a seismic mass. When the crystal is stressed in tension or compression, it generates an electrical charge which is proportional to the acceleration or vibration level it is experiencing. Internal circuitry converts this signal into a voltage or current 4 to 20mA output for data collectors or process control loops. These robust sensors have no moving parts and offer long-term stability and reliability. They have a wide frequency range and signals can be integrated to give velocity and displacement values.

Piezo-Resistive Accelerometers

These models have a seismic mass attached to a cantilever beam. The beam is deflected whilst experiencing 'g' forces and this movement is converted to an electrical signal by resistance changes in a semiconductor sensing unit element. Internal circuitry provides amplification of the signal and temperature compensation. The frequency range of these devices is lower than the piezo-electric models, having the advantage of being able to monitor static or DC acceleration levels.

ACCELEROMETERS - SELECTION TABLE

Vibration Sensitivity	Supply	Mounting Connection	Monitran List No.	Order Code
Industrial - Process Control 4-20mA Loop				
0-10mm/sec	10-32V (smoothed)	M8 male 5m armoured cable	MTN/1185CM8-10	706-8219
0-25mm/sec 0-25mm/sec	10-32V (smoothed)	M8 male 5m armoured cable	MTN/1185CM8-25	706-8268
Industrial / Laboratory, Light Weight				
100mV/g @ ±10g	As above	Bonding 5m cable with 50W BNC connector	MTN/1800	707-7415
Industrial / Laboratory, Low Frequency				
100mV/g @ 5g	10-24V dc @ 7ma 4 holes, 3mm Ø	5m armoured cable	MTN/7000-5	707-7555
50mV/g @ 50g	10-24V dc @ 7ma 4 holes, 3mm Ø	5m armoured cable	MTN/7000-50	707-7567

224692

Lightweight



- Small size and mass
- Ideal for modal analysis
- Can be configured into three axes format

- No moving parts
- Long term stability and reliability

Piezo-electric accelerometer for acceleration sensing in laboratory and R and D applications. Mount by bonding.

Frequency response	5Hz to 14kHz (3dB point 3kHz)	Temperature coefficient	5% (over full temp. range)
Resonant frequency	25kHz (nom.)	Supply Voltage	20 to 30 Volts DC
Measurement range	±10g	Connection	5m cable with 50Ω BNC connector
Sensitivity	1000mV/g ±5%	Case material	Aluminium base
Amplitude non-linearity	1% Max. over full scale	Weight	9g (nom.)
Operating temp. range	-10°C to +85°C	Sealing	IP65

212336

Mfrs. List No.	Order Code	1+	Price Each	25+
MTN/1800	707-7415	210.99	196.91	177.61

Low-Frequency



- Capable of monitoring static or DC acceleration levels
- Frequency range DC to 1kHz
- Ideal for laboratory or process control

Piezo-resistive accelerometer suitable for laboratory and R and D applications.

H=26 (overall), Base=25x25, Mounting: 4 Ø3.1 on 19.5 square pitch

Measurement ranges	±5g, ±50g
Frequency response	5g type = DC to 500Hz, 50g type = DC to 1kHz
Resonant frequency	5g type = 500Hz, 50g type = 1800Hz
Overload limits	20 in any direction
Sensitivity	5g type = 100mV/g, 50g type = 50mV/g
Operating temp. range	-25°C to +85°C
Temperature coefficient	Span 1% up to 50°C, Zero 1% up to 50°C
Supply Voltage	10 to 24 Volts DC @ 7mA
Case material	Stainless Steel
Weight	40g (nom.)
Sealing	IP65
Connection	5 metres 4-core armoured cable

212339

Sensitivity	Mfrs. List No.	Order Code	1+	Price Each	25+
100mV/g @ 5g	MTN/7000-5	707-7555	380.85	351.22	318.25
50mV/g @ 50g	MTN/7000-50	707-7567	380.85	351.22	318.25

Process Control, 4-20mA



- Direct velocity output
- Two wire 4 to 20mA industrial standard
- Easy process control loop interface
- Stand-alone use with digital meter

H=42 (excl. stud), Hex=28 A/F

Output	4 to 20mA	Electrical noise	0.3mg max.
Frequency response	2Hz to 1kHz ±10%	Transverse Sensitivity	Less than 5%
Mounted resonance	18kHz min.	Supply voltage	10-32 volts (smoothed)
Measurement range	50g peak	Standard cable	5 metres armoured PVC
Sensitivity	0-10mm/sec or 0-25mm/sec	Case material	Stainless Steel
Isolation	Base isolated	Weight	150g
Operating temp. range	-25°C to +80°C	Sealing	IP67
Temperature Sensitivity	0.08%/°C	Mounting thread	M8

212340

Sensitivity	Mfrs. List No.	Order Code	1+	Price Each	25+
0-10mm/sec	MTN/1185CM8-10	706-8219	155.47	146.87	138.78
0-25mm/sec	MTN/1185CM8-25	706-8268	155.47	146.87	138.78

Float Switches



Vertical Float

Magnetic Level Sensor



- The world's smallest magnetic Level Sensor
- Form A type
- Ruthenium (Ru) contact material
- Operating temperature -20°C to +80°C
- Polypropylene case, float and nut
- Suitable for use in water and/or dilute acids
- Designed for applications such as coffee machines, tank level control and water dispensers



	155-5936	155-5937	155-5938
Contact style	Form A	Form A	Form A
Travel - Float	3.5mm	8.5mm	18.5mm
Switching current	0.7A	1.5A	1.5A
Carry current	1.0A	2.0A	2.0A
Contact power rating	10VA	50VA	50VA
Switching voltage (Max.) dc	180V dc	200V dc	200V dc
Switching voltage (Max.) ac	130V ac	250V ac	250V ac

502073

Mfrs. List No.	Order Code	1+	5+	Price Each	25+	50+
MCPLS-020-A-3	155-5936	3.83	3.57	3.41	3.12	2.81
MCPLS-031-A-6	155-5937	4.25	3.97	3.78	3.48	3.12
MCPLS-041-A-6	155-5938	4.35	4.06	3.87	3.55	3.18

Over 480,000 products online



Horizontal



Float dia = 15.5
Mounting hole dia = 20.6

Typical Sensing Applications

- Windscreen washer bottles
- Recycled water systems
- Condensate level alarm
- Level rise or fall sensing (rotate housing 180)
- Temperature range to 60°C
- Specific Gravity to 0.8
- External fitting
- Repeatability and reliability due to Reed Switch characteristics

100-6773

100Vdc, 250Vac

1A

15VA

0.80

Acetal Copolymer (Housing), Foamed Polypropylene (Float Material)

-30°C to +60°C

EPDM

2 x 22AWG PVC insulated, 0.1m long

233624

Switching voltage
Switching current
Switching power
Min S.G.
Material
Temperature Range
Sealing Components
Cable

Description	Mfrs. List No.	Order Code	1+	25+	100+
Float switch 85.5mm	FLCS-01	100-6773●	5.40	4.74	3.25

Horizontal



Float dia = 17.3
Mounting hole dia = (16.5 internal, 23 external fitting)

Typical Sensing Applications

- Vending machines - water level
- Coolant level indication - automotive
- Boiler heating - element protection

- Drinking water level - fountain
- Fuel level - engine
- Oil level - engine

Switching voltage

120Vdc,

120Vac

Switching current

1A

Switching power

15VA

Min S.G.

0.65

Material

Glass Filled Polypropylene

Temperature Range

0°C to +

80°C

Sealing Components

Silicone

Cable

2 x 18AWG PVC insulated

233603

Type	Mfrs. List No.	Order Code	1+	25+	100+
Polypropylene(120V)	FLS801-51	100-6780●	7.94	7.36	6.83

Horizontal Float - Model SSF211

Internal Fitting



- 304 Grade stainless steel
- Internal mounting
- Compact design
- Temperature range to 120°C
- User configurable N/O or N/C action
- Reversible switch action

L = 95, Float dia. = 17

Contact type
Max. switching voltage
Max. switching current
Max. switching power
Min. S.G. of liquid
Material

NO or NC

300V ac/dc

0.5A

50 VA

0.80

Stainless steel

Max. temperature

120°C

Mounting Style

Internal

Mounting thread

1/8" BSP NPT

Lead length

500mm

Max. wall thickness

17mm

249053

Mfrs. List No.	Order Code	1+	5+	10+
SSF211X050	424-9100	37.80	35.55	34.79

Horizontal Float - Model SSF212

External Fitting



- 304 Grade stainless steel
- External mounting
- Compact design
- Temperature range to 120°C
- User configurable N/O or N/C action
- Reversible switch action

L = 102, Float dia. = 17

RoHS ● Compliant
▲ Non-compliant



08447 11 11 11

Contact type
Max. switching voltage
Max. switching current
Max. switching power
Min. S.G. of liquid
Material

NO or NC

300V ac/dc

0.5A

50 VA

0.80

Stainless steel

Max. temperature

120°C

Mounting Style

Internal

Mounting thread

1/2" NPT

Lead length

500mm

Max. wall thickness

10mm

249054

Mfrs. List No.	Order Code	1+	5+	10+
SSF212X050	424-9112	37.80	35.55	34.79

Horizontal Float - Model SSF212P

External Fitting



- 304 Grade stainless steel
- External mounting
- Compact design
- Temperature range to 120°C
- User configurable N/O or N/C action
- Reversible switch action
- Plug-in connection

L = 136, Float dia. = 17

Contact type
Max. switching voltage
Max. switching current
Max. switching power
Min. S.G. of liquid
Material

NO or NC

300V ac

0.5A

50 VA

0.80

Stainless steel

Max. temperature

120°C

Mounting Style

Internal

Mounting thread

1/2" NPT

Connection

Plug

Max. wall thickness

10mm

249055

Mfrs. List No.	Order Code	1+	5+	10+
SSF212XP	424-9124	52.22	47.22	43.10

Horizontal Float - Model SSF24

Internal Fitting



- 316 Grade stainless steel
- Internal mounting
- Compact design
- Temperature range to 120°C
- User configurable N/O or N/C action
- Reversible switch action

H = 75, L = 55, Float dia. = 28

Contact type
Max. switching voltage
Max. switching current
Max. switching power
Min. S.G. of liquid
Material

NO or NC

300V ac

0.5A

50 VA

0.80

316 Grade Stainless steel

Max. temperature

120°C

Mounting Style

Internal

Mounting thread

1/8" BSP

Lead length

350mm

Max. wall thickness

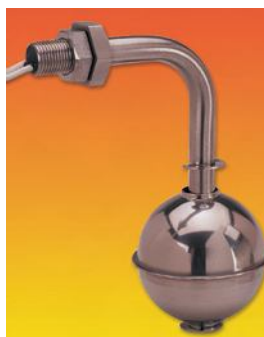
10mm

249138

Mfrs. List No.	Order Code	1+	5+	10+
SSF24X035	424-9150	45.53	41.18	37.59

Horizontal Float - Model SSF29

Internal Fitting



- 316 Grade stainless steel
- Internal side mounting
- Pressure to 40 bar
- Temperature range to 120°C
- User configurable N/O or N/C action
- Reversible switch action

H = 90, L = 55, Float dia. = 43

Contact type
Max. switching voltage
Max. switching current
Max. switching power
Min. S.G. of liquid
Material

NO or NC

300V ac

0.5A

50 VA

0.70

316 Grade Stainless steel

Max. temperature

120°C

Mounting Style

Internal

Mounting thread

1/8" BSP

Lead length

350mm

Max. wall thickness

10mm

249141

Mfrs. List No.	Order Code	1+	5+	10+
SSF29X035	424-9185	57.08	53.65	50.41

Float Switches - continued

Extended Drop Float - RSF26 Series
Internal Fitting

crydom



- WRAS Approved for use in hot or cold water
- Low level switch position
- PPS material
- High buoyancy float
- Hot/boiling water

Material	PPS	Switching power	25VA
Temp. range	-10 °C to 120 °C	Switching current	0.6A
colour	Grey	Contact form	NC
Min. Fluid SG	0.75	All ratings are for resistive load only	
Switching voltage	DC : 120 V - AC : 240V		

249301

Mfrs. List No.	Order Code	1+	Price Each	50+
RSF26	424-9367	14.60	12.82	11.57

Vertical



- SPST Switching
- Repeatability and reliability due to Reed Switch characteristics
- Top or bottom entry
- 500mm connecting lead
- Internal or External fitting
- Level rise or fall sensing (rotate housing 180°)
- Suitable for a wide range of liquids
- Nylon 6.6 or Glass Filled Polypropylene case
- UL Recognised

H=89(58 into vessel)
Float dia = 22.2
Mounting hole dia = (16.5 internal, 23 external fitting)

Typical Sensing Applications

- Deionised water
- Vending machines - Drinking water
- Food processing
- Boiler heating element protection
- Drinking water level - Hot and cold
- Irrigation systems
- Oil level
- Photographic chemicals

	100-6798	100-6797	100-6799
Switching voltage	100V dc	250V ac	250V ac
Switching current	1.0A	1.0A	1.0A
Switching power	15W	15W	15W
Min S.G.	0.7	0.85	0.7
Material - Case	Polypropylene	Nylon 6.6	Polypropylene
Temperature Range	0°C to +80°C	-30°C to +130°C	-30°C to +110°C

233606

Body Colour	Mfrs. List No.	Order Code	1+	Price Each	100+
Charcoal	VS801-51	100-6798	10.35	9.45	8.09
Blue	VS303-51N	100-6797	6.22	5.66	4.86
Charcoal	VS803-51	100-6799	9.76	8.88	7.62

Vertical



- Level rise or fall sensing (rotate float 180°)
- Suitable for a wide range of liquids
- Temperature range to 70°C
- Specific Gravity to 0.7
- Polypropylene housing
- M8 internal fitting
- Foamed or hollow float (foamed float maintains buoyancy if punctured)
- Top or bottom entry
- Repeatability and reliability due to Reed Switch characteristics

H = 59mm (45 into vessel), Float dia. = 22mm
Mounting hole dia = 8.5mm, Max. Container wall thickness = 3.5mm

Typical Sensing Applications

- Fracking equipment
- Oil tanks
- Agricultural equipment
- Condensate level - alarm system

	100-6795	100-6796
Switching voltage	250V ac	250V ac
Switching current	1A	1A
Switching power	15W	15W
Min S.G.	0.65	0.65
Float Type	Foam	Hollow
Material - Housing	Polypropylene	Polypropylene
Temperature Range	-30 to +60°C	-30 to +70°C
Sealing Components	Silicone	Silicone
Cable	2 x 22AWG PVC insulated, 0.1m long	2 x 22AWG PVC insulated, 0.1m long

233612

Model Type	Mfrs. List No.	Order Code	1+	Price Each	100+
Foamed Polypropylene (float Material)	VCS-02	100-6795	5.44	4.78	3.28
Polypropylene (Housing), Hollow Polypropylene (Float Material)	VCS-04	100-6796	5.84	5.11	3.50

Vertical - Stainless Steel



- Level rise or fall sensing (rotate float 180°)
- Suitable for a wide range of liquids
- Temperature range to 120°C
- Specific Gravity to 0.7
- Stainless Steel
- Robust construction
- Internal fitting
- Top or bottom entry
- Repeatability and reliability due to Reed Switch characteristics
- Interface unit available Order Code 730-816
- Typical Sensing Applications
- Vending machines - Drinking water
- Food processing
- Drinking water level - Hot and cold
- Boiler heating element protection

H=78(47 into vessel), Float dia = 28
Mounting hole dia = 16.5, Max wall thickness = 10

Switching voltage	100Vdc, 250Vac	Material	Stainless Steel
Switching current	1A	Temperature Range	-30°C to +120°C
Switching power	15VA	Sealing Components	Silicone
Min S.G.	0.75	Cable	2 x 18AWG PVC insulated

233601

Mfrs. List No.	Order Code	1+	Price Each	10+	25+
FVSS-01	100-6801	40.19	38.89	34.21	

Vertical Float - Model SSF22

crydom

Internal Fitting



- 316 Grade stainless steel
- Internal mounting to top or bottom
- Compact design
- Temperature range to 120°C
- User configurable N/O or N/C action
- Reversible switch action

Contact type	NO or NC
Max. switching voltage	300V ac
Max. switching current	0.5A
Max. switching power	50 VA
Min. S.G. of liquid	0.80
Material	316 Grade Stainless steel
Max. temperature	120°C
Mounting Style	Internal
Mounting thread	1/8" BSP
Lead length	350mm
Max. wall thickness	20mm

H=53, Float dia. = 28

249137

Mfrs. List No.	Order Code	1+	Price Each	5+	10+
SSF22X035	424-9148	31.41	28.41	25.92	

Vertical Float - Model SSF26

crydom

Internal Fitting



- 316 Grade stainless steel
- Internal mounting at top or bottom of tank
- Tank access required
- Temperature range to 200°C
- User configurable N/O or N/C action
- Reversible switch action

H=95, Float dia. = 50

Contact type	NO or NC	Max. temperature	200°C
Max. switching voltage	300V ac	Mounting Style	Internal
Max. switching current	0.5A	Mounting thread	3/8" BSP
Max. switching power	50 VA	Lead length	350mm
Min. S.G. of liquid	0.65	Max. wall thickness	14mm
Material	316 Grade Stainless steel		

249139

Mfrs. List No.	Order Code	1+	Price Each	5+	10+
SSF26X035	424-9161	101.53	95.44	89.71	

Vertical Float - Model SSF28

Internal Fitting

crydom



H=74, Float dia.=43

- 316 Grade stainless steel
- Internal mounting at top or bottom of tank
- Tank access required
- Temperature range to 120°C
- Pressure up to 40 bar
- User configurable N/O or N/C action
- Reversible switch action

Contact type	NO or NC	Max. temperature	120°C
Max. switching voltage	300V ac	Mounting Style	Internal
Max. switching current	0.5A	Mounting thread	1/8" BSP
Max. switching power	50 VA	Lead length	350mm
Min. S.G. of liquid	0.70	Max. wall thickness	10mm
Material	316 Grade Stainless steel		

249140

Mfrs. List No.	Order Code	1+	5+	10+
SSF28X035	424-9173	45.99	43.24	40.65

Extended Vertical Float



H=260 (224 into vessel), Float dia = 30
 Mounting hole dia = 16.5 internal, 23 external fitting
 Max wall thickness = 10 internal, 4 external fitting

- Two position level switch
- High and low level sensing
- Suitable for a wide range of liquids
- Temperature range to 130°C
- Specific Gravity to 0.8
- Nylon 6.6 or Brass housing
- M8 internal or external fitting
- Top or bottom entry
- Both switches closed with float down
- High repeatability and reliability due to Reed Switch characteristics

Typical Sensing Applications

- Water level, high and/or low
- Boiler heating element protection
- Coolant level indication
- Waste water level
- Cooking oil level
- Sump level

Switch Specifications - (When mounted from the top)

Contact Form	Form B - SPST
Switching voltage	100V dc
Switching current	0.3 A
Switching power	3W
Min S.G	0.8
Cable	3 x 18AWG PVC insulated, 0.5m long
Cable Colours	Black/White

233615

Type	Mfrs List No.	Order Code	1+	10+	25+
Nylon 6.6	FEVS312-51	100-6764	21.47	19.73	17.89
Brass	FEVS722-51	100-6765	35.76	32.86	30.89

Dual Position Float - RSF66 Series

Internal Fitting

crydom



- WRAS Approved
- Simple to mount and use
- PPS material
- Switching capability to 240VAC

Material	PPS	Switching voltage	DC : 120 V - AC : 240V
Temp. range	-10 °C to 85 °C	Switching power	25VA
colour	Grey	Switching current	0.6A
Min. Fluid SG	0.85	All ratings are for resistive load only	

Order Code	Upper Switch Level	Lower Switch Level	Total Length
424-9318	25mm	75mm	102mm
424-9320	25mm	100mm	127mm
424-9331	25mm	125mm	152mm
424-9343	25mm	150mm	177mm
424-9355	25mm	175mm	202mm

Notes: Upper switch is open when level is low, closing when level rises to 25mm from top. Lower switch is open when level is high, closing when level falls to the lower switch level as indicated in the chart.

249264

Mfrs. List No.	Order Code	1+	5+	10+
RSF66A25B75	424-9318	27.39	24.06	21.70
RSF66A25B100	424-9320	26.73	23.46	21.17
RSF66A25B125	424-9331	27.39	24.06	21.70
RSF66A25B150	424-9343	27.39	24.06	21.70
RSF66A25B175/538	424-9355	27.39	24.06	21.70

Right Angle



- Level rise or fall sensing (rotate float 180°)
- Suitable for a wide range of liquids
- Temperature range to 80°C
- Specific Gravity to 0.7
- Glass Filled Polypropylene
- UL Recognised
- Side tank entry
- Internal or External fitting
- Repeatability and reliability due to Reed Switch characteristics

Float dia = 22.2

Mounting hole dia = 16.5mm internal, 23mm external fitting

Max wall thickness = 10mm internal, 4mm external fitting

Typical Sensing Applications

- Coolant level indication
- Condensate level alarm
- Vending machines - Drinking water
- Boiler heating element protection
- Drinking water level - (WRC approved for Cold)

	100-6791	100-6792
Switching voltage	100Vac/dc	250V ac, 100V dc
Switching current	1A	1A
Switching power	15W	15W
Min S.G	0.65	0.65
Material	Polypropylene	Polypropylene
Temperature Range	-30 to +80°C	-30°C to +80°C
Sealing Components	Silicone	Silicone
Approvals	UL	UL
Cable	2 x 18AWG PVC insulated	2 x 18AWG PVC insulated

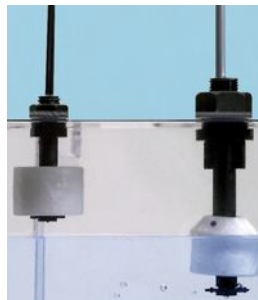
233594

Colour	Mfrs. List No.	Order Code	1+	25+	100+
Charcoal	RS801-51	100-6791	11.30	10.30	8.84
Blue	RS803-51	100-6792	10.71	9.78	8.39

Reed Level Sensor

Water or Dilute Acid

MEDER electronic



LS02 - L (overall) = 75, Dia. (float) = 23.5mm



LS03 - L (overall) = 80, Dia. (float) = 17.2mm

Standard liquid level sensors for water applications and dilute acids. The shaft, nut and float are manufactured from black polypropylene, the seal from nitrile rubber. They are terminated by a PVC cable with across section of 0.14mm² and a length of 500mm.

The LS02 has to be mounted vertically; the LS03 version should be mounted horizontally.

Contact Form	1A / 1B	Switching current A (max)	0.5
Contact resistance mR (max)	150	Switch carry current A (max)	1
Switch power W (max)	10	Breakdown voltage V dc	240
Switch voltage V dc (max)	200	Temperature, operating °C	-20 to +90

417823/436283

Mfrs. List No.	Order Code	1+	10+	25+	50+
LS02-1A71-PP-500W	107-9489	6.37	5.30	4.78	3.50
LS02-1B71-PP-500W	107-9490	5.53	4.60	4.14	3.04
LS03-1A71-PP-500W	107-9491	6.79	5.67	5.10	3.74

Over 480,000 products online



14



Float Switches - continued

Horizontal Float - RSF40 Series

Internal Fitting



Compact
151-643 L=73 (overall),
 60 (actuator), Mtg. hole dia.=12.7
151-644 L=70 (overall),
 57 (actuator), Mtg. hole dia.=16.5
732-709 L=88 (overall),
 55 (actuator), Mtg. hole dia.=16.5
 Max. vessel wall thickness=4
Standard
146-300 L=116 (overall), 94 (actuator),
 Mtg hole dia.=12.7
 Max vessel wall thickness=6

- Use to indicate either high or low levels
- Choice of materials and sizes for different applications

The units are supplied with normally open contacts, but by inverting the float bobbin the contacts become normally closed.

Liquid level float switches designed to be mounted on the side of a vessel from the inside. Contacts close when the pivoted actuator magnet comes close to the reed switch in the main body. Supplied with fixing nut and sealing ring and 1m of PVC cable.

(607-320 = 0.5m)

151-643: Compact size suitable for use with non-corrosive fluids with temperatures varying up to 100°C.

151-644: Compact size, giving a significantly longer life at sustained temperatures of 80°C to 100°C. It is also compatible with a variety of industrial chemicals.

732-709: Compact size. Material is PPS (polyphenylene sulphide). 120°C max. operating temperature, ideal for applications with continuous exposure to boiling water. Good resistance to wide range of chemicals and to water absorption. **UL** and **WRC** approval.

146-300: Standard size with higher contact rating, suitable for non-corrosive fluids and **WBAS** approved for use with drinking water, suitable for food industry equipment.

Order Code	151-643	151-644	732-709	146-300
Style	Compact	Compact	Standard	Standard
Case material	Nylon	Polypropylene	PPS	Nylon
Mtg. hole dia.	12.7mm	16.5mm	16.5mm	12.7mm
Max. switch current	0.5A	0.5A	1A	2A
Max. switch voltage	250V ac/ 300V dc	440V ac/ 1000V dc	440V ac/ 1000V dc	250V ac/ 300V dc
Contact rating	15VA	15VA	25VA	100VA
Min SG of liquid	0.85	0.85	0.85	0.80
Temperature range °C	-20° to +75°	-20° to +100°	-10° to +120°	-20° to +75°
Case colour	Dull Black	Opaque	Grey	Dull Black

212428

Order Code	Mfrs. List No.	Order Code	1+	25+	100+	250+
Compact Size						
Nylon	RSF43Z100JC032	151-643	8.15	7.42	6.53	6.07
Polypropylene	RSF44Z100JF035	151-644	8.87	8.07	7.02	6.47
PPS	RSF46Y050TG515	732-709	13.06	12.01	11.14	10.34
Standard size						
Nylon	RSF33W100NC	146-300	11.61	10.94	10.21	7.74

Liquid Level Sensor

LCS Series - Side Entry



L (Sensor body) = 68mm, Dia. (Float) 15.5mm

- Rapid push fit installation
- Reedswitch reliability
- Temperature range to 60°C
- Horizontal - Side entry
- Normally open or normally closed by float rotation
- Acetal housing and Polypropylene Float
- EPDM Sealing Grommet
- Integral AMP Econoseal Connector
- Connector available with 1 meter of automotive cable

Typical Sensing Applications

- Water high or low level
- Central heating systems
- Fuel low level
- Drinking water level
- Organic solvents

Contact Form	Form A - SPST
Switching voltage	250V ac
Switching current	1A
Switching power	15W
Minimum specific gravity	0.80
Housing temperature range	60°C

508274

Type	Mfrs List No.	Order Code	1+	5+	10+
Sensor	LCS-02	100-6774●	6.97	6.11	4.20
Connector	CA-01	100-6762●	1.54	1.50	1.36

Horizontal Float - RSF70 Series

External Fitting



- UK Water Research Council Approved
 - **UL** Recognised
 - Rotate 180°, rise or fall to operate
- L=88 (overall), 55 (actuator),
 Mounting hole dia.=23.0,
 Max. wall thickness=4.0, Leads L=0.5m

Horizontal liquid level switches similar to RSF40 (Compact) Series, but incorporating a compression seal to permit fitting from outside the vessel. SPST switch action using reed switch.

	730-609	730-610	732-722
Max. switching voltage	240V ac, 120V dc	240V ac, 120V dc	240V, 120V
Max. switching current	0.6A	0.6A	0.6A
Max. power	25W	25W	25W
Min. S.G. of liquid	0.85	0.85	0.85
Material	GFS Nylon	GFS Polypropylene	PPS
Temperature range	-20°C to +75°C	-20°C to +100°C	-10°C to +120°C
Case colour	Black	Opaque	Grey

212280

	Mfrs. List No.	Order Code	1+	10+	50+
GFS Nylon	RSF73Y050ORM	730-609	7.20	6.62	5.97
GFS Polypropylene	RSF74Y050ORM	730-610	10.69	8.99	7.91
PPS	RSF76Y050TV518	732-722	15.29	14.06	13.02

Horizontal, Drop Float



L=102 (overall), 69 (inside vessel)
 Mtg. hole dia.=16.5, Max. wall thickness=6.0, Leads L=0.5m

- Special 'drop-float' actuator allows the switch housing and float pivots to be located above the surface of the liquid
- Eliminates problems caused by the pivot points on a conventional float switch sticking due to limescale build-up etc.
- Polypropylene type is compatible with a variety of industrial chemicals

- Polysulfone type is **FDA** approved, suitable for food grade applications
- PPS type will withstand continuous exposure to boiling water
- PPS type has good resistance to wide range of chemicals and to water absorption
- High 25W rating
- **UL** Recognised and **WRC** approved

The switch provides a normally closed contact, opening as the liquid level rises. It is mounted on the side of the vessel from the inside.

	730-622	732-692
Max. switching voltage	240V ac, 120V dc	240V ac, 120V dc
Contact rating	25VA	25VA
Max. switching current	0.6A	0.6A
Min. S.G. of liquid	0.80	0.80
Material	Polypropylene	PPS
Temperature range	-20°C to +100°C	-10°C to +120°C
Case colour	Opaque	Grey

212272

	Mfrs. List No.	Order Code	1+	10+	50+
Polypropylene	RSF14Y050RF502	730-622	12.93	11.89	10.36
PPS	RSF16Y050TG517	732-692	13.92	12.79	11.15

Vertical Float - RSF50 Series



- **UL** recognition on N/O contact versions
- High 25W rating on N/O versions
- Float reversal, rise or fall to operate (N/O versions)
- Nylon, polypropylene or PPS (polyphenylene sulphide) body
- Normally open or changeover contacts
- PPS type withstands continuous exposure to boiling water
- PPS type gives good chemical and water absorption resistance

H=70 (overall), 44 (inside vessel)
 Float dia.=27, Mtg. hole dia.=12.2
 Cable L=1m

	730-646	730-658	730-660	730-671	732-710
Contacts	N/O (Form A)	C/O (Form C)	N/O (Form A)	C/O (Form C)	N/O (Form A)
Case material	Nylon	Nylon	Polypropylene	Polypropylene	PPS
Switching current @ 0-30V	0.6A ac/ 0.5A dc	--	0.6A ac/ 0.5A dc	--	0.6A ac/ 0.5A dc
Switching current 120V	0.2A ac/ 0.15A dc	--	0.2A ac/ 0.15A dc	--	0.2A ac/ 0.15A dc
Switching current 240V	0.1A ac	--	0.1A ac	--	0.1A ac
Max. switch current	--	0.25A	--	0.25A	--
Max. switch voltage	--	48V ac/28V dc	--	48V ac/28V dc	--
Max. power	25VA	3VA	25VA	3VA	25VA
Min. S.G. of liquid	0.80	0.80	0.80	0.80	0.80
Temperature range °C	-20 to +75	-20 to +75	-20 to +100	-20 to +100	-10 to +120
Case colour	Black	Black	Opaque	Opaque	Grey

212278

	Mfrs. List No.	Order Code	1+	25+	100+
Nylon N/O	RSF53Y100RC	730-646	8.64	7.59	6.64
Nylon C/O	RSF53V100MC	730-658	11.01	9.63	8.38
Polypropylene N/O	RSF54Y100RC	730-660	9.71	8.26	7.41
Polypropylene C/O	RSF54V100MC	730-671	11.39	9.95	8.67
PPS N/O	RSF56Y050TB516	732-710	11.53	10.68	9.34

Variable Insertion Depth Vertical Float

crydom



- Variable insertion depth float switch is capable of a maximum insertion depth of 450mm
- Insertion depth can be increased by the use of extension tubes, each 306mm long including the connection adaptor
- A maximum of 3 extension tubes can be utilised to achieve a maximum insertion depth of 1350mm
- UL Recognised

The extension tube is fitted by initially removing the cable gland from the float switch and screwing the extension tube to the float switch. The cable gland is then reassembled into the end of the extension tube. The float switch is mounted at the desired level using the clamp supplied.

Temperature range	0°C to +75°C	Min. SG of liquid	0.85
Max. voltage	50V ac/dc	Float material	Polypropylene
Max. current	0.5A ac	Stem material	Polyphenylene sulphide (PPS)
Max. power	10W/VA	Body/extension	PVC, class 7

212273

	Mfrs. List No.	Order Code	1+	5+	10+	25+	50+
Switch	RSF64EXS	730-683	27.77	26.80	25.03	22.83	21.18
Extension	RSF64EXT	730-695	4.65	4.47	4.14	3.83	3.54

Vertical Float

ASSEMBLY EUROPE



- Liquid level float switch for vertical mounting, suitable for either high or low level indication
- Suitable for use in fresh and salt water, diesel oil, paraffin and various dilute acid and alkaline solutions

The units are supplied with normally open contacts, but by inverting the float bobbin the contacts become normally closed. Supplied with a 1m PVC cable.

Max. switching current	1A
Max. switching voltage	240V ac, 300V dc
Max. switching power	24VA
Min. S.G. of liquid	0.80
Temperature range	-10°C to +75°C
Case Material	Polypropylene

L=48 (overall), Mtg dia = 1/8",
Float travel = 9.5, Float dia = 25

212429

		Price Each		
Order Code	1+	25+	100+	250+
103-846	11.09	9.91	8.77	8.17

Stainless Steel, Vertical Float
Horizontal/Vertical Mounting

ASSEMBLY EUROPE



Mounting hole dia. = 10, Leads L = 0.3m

Stainless steel liquid level sensors with vertical float, versions available for vertical mount and horizontal mount with right angle stem. Designed to operate in a wide range of environments. SPST switch action.

- Internal vessel mounting
- 50W switching capability
- Float reversal, rise or fall to operate
- UL Recognised
- Top or bottom tank mounting
- Silicone sealing washer

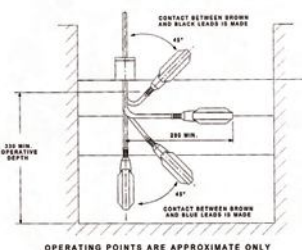
Switching Capacity	50W	Min. S.G. of liquid	0.75
Switching Voltage	240V ac/200V dc	Case material	Stainless Steel 304
Switching/Carry current	0.5A/1A	Operating pressure	10 Bar
Operating temperature	-10°C to +120°C (intermittant to 200°C)		

212238

	Mfrs. List No.	Order Code	1+	5+	10+	25+
Vertical mount	RF3001A/VFS30	730-180	46.37	45.39	40.10	38.08
Horizontal mount	RF3002A/HFS30	730-191	59.50	58.25	52.11	49.48

Level Regulators - Overview of Operation

TRITON CONTROLS LTD.



The sealed float chamber swings vertically about a weight attached to the cable, which causes the contacts to change as the liquid level falls and rises.

234882

Level Regulators - LR02 & LR02IS - ATEX Approved

TRITON CONTROLS LTD.

5m, 10m, 20m cable

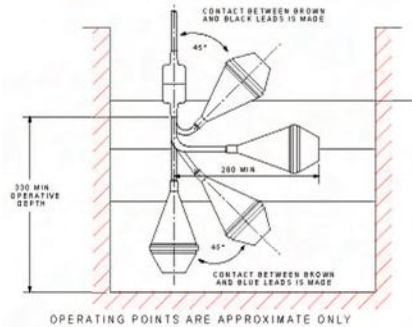


Sealed float chamber in synthetic rubber housing. Float swings vertically about weight. Contacts change state as liquid level falls or rises.



- Chemical-resistant HYPALON rubber housing
- Changeover contacts, three core cable
- Simple to install
- Trouble-free operation

Float: L=170, Dia.=90



Contact rating	LR02 = 250V, 5A
Max. temperature	70°C
Specific Gravity	0.80 to 1.3
Max. submerged depth	20 metres
Actuation	LR02 : Internal roller ball and microswitch arrangement
Position of weight	Fixed, 120mm from float

WARNING: MERCURY SWITCHES SHOULD NOT BE OPENED

212313

Cable Length	Mfrs. List No.	Order Code	1+	5+	10+	25+
Non-mercury Regulators						
5m	LR02-L05M	706-3830	38.78	35.36	31.25	28.09
10m	LR02-L10M	706-3842	44.66	40.73	36.00	32.34
20m	LR02-L20M	706-3854	56.46	51.52	45.51	40.90
ATEX Rated						
5m	LR02IS-L05M-ATEX	129-9548	28.03	26.50	25.44	23.14
10m	LR02IS-L10M-ATEX	129-9549	51.72	48.92	46.97	42.69
20m	LR02IS-L20M-ATEX	129-9550	65.40	61.86	59.39	53.99

Miniature Mercury Level Regulator - LR04

TRITON CONTROLS LTD.

1m Cable



Float: L=99, Dia.=42, Cable L=1m

- Miniature suitable for small tanks
- Changeover contacts, 3 core cable
- Chemical-resistant HYPALON rubber housing
- Simple to install
- Trouble-free operation
- Both contacts open between make and break

Sealed float chamber in synthetic rubber housing. Float swings vertically about a fixed position where cable is attached to side of tank. Contacts change state as liquid level falls or rises.

Contact rating	250V, 6A	Max. submerged depth	1 metre
Max. temperature	70°C	Actuation	Internal mercury level switch
Specific Gravity	0.90 to 1.3		

WARNING: THIS SWITCH SHOULD NOT BE OPENED AS IT CONTAINS MERCURY, A TOXIC SUBSTANCE

212348

Cable Length	Mfrs. List No.	Order Code	1+	5+	10+	25+
1m	LR04-L01M.	706-4925	14.49	12.99	11.47	10.30



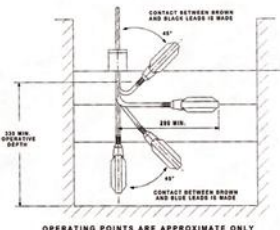
Float Switches - continued

Level Regulators - LR03, LR06, LR07
PVC, CPE, PUR and EPDM cable

Sealed float chamber in plastic housing. The float swings vertically about a weight attached to the cable or the cable attachment point on the side of the vessel, which causes the contacts to change as the liquid level drops or rises.

Change over contacts, three core cable available with:

- LR03, PVC cable for general use
- LR03, CPE cable for use in sewerage
- LR06, PUR cable for use in DIESEL OIL
- LR07, WRAS Approved EPDM cable for use in POTABLE WATER
- Easy to install and inexpensive
- Non mercury construction
- Trouble-free operation
- Optional adjustable ballast weight
- Non-mercury level regulator



OPERATING POINTS ARE APPROXIMATE ONLY

Float: L=103, W=81 Weight: L=57, Dia.=50

Contact rating	250V, 15A
Max. temperature	70°C
Specific Gravity	0.90 to 1.3
Max. submerged depth	20 metres
Actuation	Internal steel roller ball and microswitch arrangement
Position of weight	Adjustable, 280mm minimum from end of float

212312

Cable Length	Cable Type	Mfrs. List No.	Order Code	1+	5+	10+	25+
5m	PVC	LR03-L05M	706-4263▲	12.43	11.13	9.84	8.85
10m	PVC	LR03-L10M	706-4275▲	15.02	13.46	11.89	10.69
5m	PUR	LR06 L05M	388-9841▲	21.42	19.18	16.96	15.23
10m	PUR	LR06 L10M	388-9853▲	31.71	28.40	25.13	22.55
5m	EPDM	LR07 L05M	388-9877▲	23.97	21.46	18.99	17.06
10m	EPDM	LR07 L10M	388-9889▲	36.13	33.00	29.18	26.20
5m	CPE	LR03-L05M-CPE	129-9545●	17.84	16.87	16.20	14.72
10m	CPE	LR03-L10M-CPE	129-9546●	24.32	23.00	22.08	20.07
Weight LR03/LR06		LR03-W	706-4287▲	2.80	2.52	2.22	1.99
Weight LR07		LR07-W	390-6541▲	2.80	2.52	2.22	1.99

High Level Alarm



- For use with all Triton float switches
- All connections via internal terminal blocks
- Adjustable buzzer
- Remote alarm facility

Enclosure	Weatherproof plastic to IP55
Power Supply	230Vac
Battery Back-up	Internal 12V/150mA rechargeable battery pack
Fuse	1A (F) internal
Alarm	Piezo-electric buzzer, pulse tone 103dB
Alarm mute	Front panel push button. Red indicator continues to flash after buzzer is muted.

234884

Mfrs. List No.	Order Code	1+	5+	10+	25+
LR 10.	388-9907▲	228.53	208.64	184.54	165.70

Cable End Float - FFS Series



Internal Fitting



- Hermetically sealed
- Direct power switching
- Cable mounting
- 100 metre depth capability

Material	Polyethylene, High Density
Temp. range	0 °C to 55 °C
Lead length	5m
Max. working pressure	10 bar
Switching voltage	AC : 250 V - DC : 110V

L=333, Float h. =130mm, Float dia.=60mm

Specification	10A Switches
Power rating	AC : 750VA - DC : 180W
Switching current Max. resistive	10A
Switching current Max. inductive	AC : 4A - DC : 1A

249229

Contact type	Mfrs. List No.	Order Code	1+	5+	10+
10A Switches					
NO	FFS10A	424-9197	25.69	22.55	20.33
NC	FFS10B	424-9203	19.54	17.15	15.47
C/O	FFS10C	424-9215	25.69	22.55	20.33

Cable End Float - FFS Series WRAS Approved



Internal Fitting



- Hermetically sealed
- Direct power switching
- Cable mounting
- 100 metre depth capability
- WRAS Approved

Material	Polyethylene, High Density
Temp. range	0 °C to 55 °C
Lead length	5m
Max. working pressure	10 bar
Switching voltage	AC : 250 V - DC : 110V

Specification	10A Switches
Power rating	AC : 750VA - DC : 180W
Switching current Max. resistive	10A
Switching current Max. inductive	AC : 4A - DC : 1A

L = 333, Float h. =130, Float dia. =60mm

249262

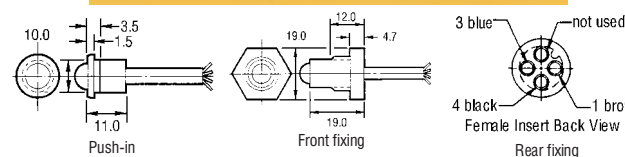
Contact type	Mfrs. List No.	Order Code	1+	5+	10+
10A Switches					
C/O	FFS10CW	424-9276	26.64	23.39	21.11

Optical Level Switches



Optical Liquid Level Sensor

Solid State



Solid state liquid level sensors incorporate an optoschmitt trigger which provides a digital output that denotes the present or absence of a liquid. The plastic dome contains an LED and the optoschmitt sensor, arranged so that when it is not covered by a liquid, a light path is established between them by total internal reflection.

Three mounting styles are available. The two threaded styles have a stainless steel fixing nut and fluorosilicone rubber gasket supplied, which fix the sensor from on one type and from the rear on the other. The push-in style may be fitted into metal housings or plastic bodies, in some cases an O-ring is recommended to help in the sealing of the finished product.

- Solid state reliability
- Fast response
- Wide temperature range -25°C to +100°C
- Polysulphone body compatible with most industrial liquids
- Suitable for venting machines, food processing and tank level applications

Power Supply	Optoschmitt LED	4.5V dc to 12V dc (5V dc above 85°C)200mA 5V dc, 30 to 40mA (1.1 to 1.4V dc typ)
--------------	-----------------	---

Output current	200mA max sinking
Mounting thread	-40°C to +125°C
Connections	250mm flying leads

383310/406083

Type	Mfrs. List No.	Order Code	1+	10+	25+	100+
Push-in	LLE105100	868-8303▲	21.68	19.55	17.94	15.51
Front fixing	LLE102101	868-8311▲	20.70	18.64	17.07	14.78
Rear fixing	LLE103101	868-8320▲	21.61	19.47	17.45	14.78

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Solid State, Industrial

Honeywell



L=90 (overall)

Thread = 1/2" BSP, Hex = 24 A/F,
Connection thread = M12 1

- Solid state reliability, no moving parts
- Stainless steel, high pressure housing with IP67 protection
- Wide temperature range -40°C to +125°C
- Designed for industrial environment, exposed to extremes of temperature, pressure, vibration and shock
- Polysulphone sensor dome suitable for hygiene applications
- 3-pin M12 plug-in connection

- TTL-compatible 200mA sinking output, fast response

Industrial version of Honeywell solid state liquid level sensor, working on principle of total internal reflection and providing a digital output that denotes the presence or absence of liquid.

Supply voltage 10V to 40V dc Hysteresis 1mm dependent on liquid
Supply current 35mA (LED), 8mA typ. (opto-Schmitt) Repeatability ±1mm

222174

Mfrs. List No.	Order Code	Price Each			
		1+	5+	10+	25+
LLN865172-1	723-4612	104.79	99.57	94.31	92.45

Conductive Level Controllers

Miniature Controller - 61FGPN

OMRON



H = 50,
W = 38, D = 70

- Space saving version of the 61F-GP general purpose conductive level controller
- Suitable for single or two point level control of conductive materials (liquid or solid)

Electrical connections are via a plug-in octal base.

Operating voltage 110V ac or 240V ac
(-15%, +10%)
8V ac
Output changeover relay 5A @ 240V ac/24V
Dielectric strength 1500V ac 50/60Hz
Power consumption 3.2VA max.
Temperature range -10°C to +55°C

224703

Operating Voltage	Mfrs. List No.	Order Code	1+	5+	10+
110V ac	61F-GPN2 110AC	177-887	47.46	45.10	42.73
240V ac	61F-GPN2 240AC	177-888	47.46	45.10	42.73
Surface/DIN	PF083A-E	134-0949	2.43	2.31	2.18

Controllers - 61FGP Series

OMRON



H = 92 (overall), W = 64, D = 68

- Plug-in conductive level controllers ideally suited to control top and/or bottom levels of fluids
- For use in conjunction with appropriate electrode assembly

General Purpose Type: Single point or differential level control of all conductive liquids. Also suited for refrigeration as an ice bank controller.

High Sensitivity Type: For liquids having very high specific resistance of the order of 10 5 Ω/cm, such as boiler condensation, distilled water and damp sand.

Operating voltage 24V ac to 240V ac 50/60Hz
Operating voltage range 85 to 110%
Contact rating 3A @ 250V ac (Resistive load), 1A @ 250V ac (Inductive load)
Insulation resistance 100Mohm @ 500V dc
Dielectric strength 2000V ac
Power consumption 3.5VA max.
Temperature range -10°C to +55°C

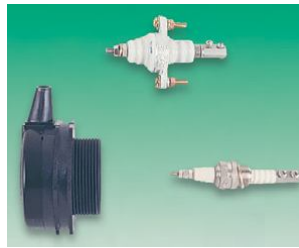
Type	Probe Voltage	Operate Resistance	Release Resistance (Max.)
General purpose	8V ac	4kW	15kW
High sensitivity	24V ac	70kW	300kW

224704

Operating Voltage	Mfrs. List No.	Order Code	1+	5+	10+	+
General Purpose	ac 61FGPN8110AC	160-3070	41.75	39.23	37.85	--
	ac 61FGPN8240AC	160-3071	41.75	39.23	37.85	--
High Sensitivity	ac 61FGPN8H240AC	160-3072	45.98	43.21	41.69	--
	Screw terminal base 8PFA1	160-3074	5.45	5.12	4.94	--

Electrode Holders

OMRON



Electrode Order Code 103-275 is suitable for the above holders.

- Single electrode holder for low specific resistance liquid applications, suitable for acids, alkalis and seawater. Electrode holders will operate correctly when they are up to 1 metre apart
- Triple electrode holder, suitable for three electrodes, has protective terminal cover. Suitable for city water and other general applications
- Single electrode holder available for temperatures up to 250°C and pressures up to 20kg/cm² at the lower portion of the electrode screw. Withstand temperature at the upper portion of the screw is 150°C

224705

	Mfrs. List No.	Order Code	Price Each		
			1+	5+	10+
Single	BF1	103-268	8.34	7.85	7.68
Triple	PS3S	160-3075	22.24	20.90	20.16
Single (high temp./pressure)	BS1	160-3076	27.24	25.59	24.70

Triple Electrode Set

OMRON



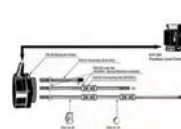
- Triple electrode holder complete with three 1 metre 4mm diameter probes
- Small size and light weight for where limited space is available

224706

Mfrs. List No.	Order Code	Price Each		
		1+	5+	10+
PS31	160-3077	15.88	14.91	14.39

Electrodes and Accessories

OMRON



- Stainless electrodes are 1 metre length 6mm diameter and threaded at each end
- Electrodes can be used in fresh water, drained water, sea water, alkalis and dilute acids
- Electrode separators are used to prevent mutual contact between electrodes
- Electrode connectors connect electrodes together to make longer lengths

The electrodes suit electrode holders Order Code 103-268, 160-3075 & 160-3076

Electrode separators are particularly useful where electrodes are being coupled together to form longer lengths.

224707

	Mfrs. List No.	Order Code	Price Each			
			1+	5+	10+	25+
Electrode	F0301	160-3080	10.33	9.71	9.37	8.99
Electrode separator	F03143P	160-3078	1.68	1.57	1.52	1.46
Electrode connector	F0302	160-3079	1.46	1.38	1.33	1.28

Mass Airflow Sensors

Precision mass Airflow Sensor

OMRON

0 to 3 litres per minute



- Precision unidirectional mass airflow up to 3 l/min
- Stable output across full scale
- Ultra-compact size
- Low power consumption

Power Supply voltage 10.8V dc to 26.4V dc
Current consumption 15mA (no load)
Max. Output voltage - V_{OH} 5V dc to 5.7V dc
Min. Output voltage - V_{OL} 0V dc to 1V dc
Sealing IP40
Operating temperature 0°C to 50°C

H = 16.8 (Overall), W = 36.6, D = 8mm

435502

Mfrs. List No.	Order Code	Price Each		
		1+	5+	10+
Sensor D6F-03A3-000	120-4011	152.85	145.15	137.57
Connector Cable D6F-CABLE2	120-4018	5.67	5.32	5.05

Over 480,000 products online



Mass Airflow Sensors - continued

MEMS Uni-directional Mass Flow Sensor

Dust Resistant



H = 27.2, W = 23.3,
D = 10mm (body)

- Unique Dust Segregation System (DSS)
- Cyclone flow structure diverts particulate from sensor element
- PCB Mounted and Connector models available
- High accuracy, reliable mass flow measurement
- Alternative to differential pressure sensing
- Measure over 200 l/min with a bypass set-up

Supply voltage - V dc
Current Consumption
Operating Humidity
Operating Temperature

5V dc to 10V dc
15mA
Under 85% RH
-10°C to 60°C

New

518082

Connection Type	Mfrs. List No.	Order Code	1+	25+	50+
PCB Terminals	D6F-P0010A1	157-3150	36.23	35.51	34.81
3 Pin Connector Version	D6F-P0010A2	157-3151	36.23	35.51	34.81

Mass Flow Sensor



D6F-01A1
H = 33, W = 33, D = 9mm



D6F-05N2
H = 22.1, W = 62, D = 21.6mm

These small mass flow sensors combine high accuracy with fast response. Therefore they have many applications sensing air, non-corrosive gas and Liquid Natural Gas (LNG) in medical apparatus, combustion control and analysis equipment. Output is via a Molex 3 pin connector. The devices are supplied complete with the connector and 100mm lead.

Supply voltage - V dc	Min.	Max.	Operating Humidity	Min.	Max.
Current Consumption	10.8	26.4	Operating Temperature	-25°C	Under 85% RH
		60mA			+55°C

418055

Gas Type	Mfrs. List No.	Order Code	1+	5+	10+
Air, 0 - 1 L/min	D6F-01A1-110	100-7612	91.89	82.70	73.50
LNG, 0 - 5 L/min	D6F-05N2-000	100-7614	165.12	156.85	149.01

MEMS Flow Sensor

Dust Resistant



- Dust resistant design
- Incorporates the patent pending Dust Segregation System (DSS)
- 99.5% of dry airborne particulates separated
- Consistent air velocity measurement

Supply voltage - V dc
Current Consumption
Operating Humidity
Operating Temperature

H = 13, W = 8, D = 22mm

OMRON

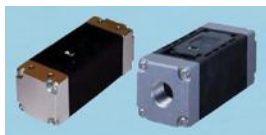
New

518055

Flow Range	Mfrs. List No.	Order Code	1+	25+	50+	100+
0 to 3m/s	D6F-V03A1	157-3149	20.86	19.13	17.39	15.65

Precision mass Airflow Sensor

0 to 50 litres per minute - in 3 ranges



H = 30, W = 78, D = 30mm

- Precision unidirectional mass airflow up to 50 l/min
- Stable output across full scale
- Horizontal mounting feature with NBR "O" ring (A5 Type)
- Straight connect Rc 1/4 screw (A6 Type)
- Compact size
- Low power consumption

Power Supply voltage	10.8V dc to 26.4V dc	Min. Output voltage - V _{OL}	0V dc to 1V dc
Current consumption	15mA (no load)	Sealing	IP40
Max. Output voltage - V _{OH}	5V dc to 5.7V dc	Operating temperature	-10°C to 60°C

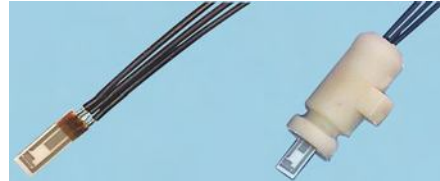
435503

OMRON

Flow Range	Mfrs. List No.	Order Code	1+	5+	10+
A5 Type Sensors					
0 to 10 l/min	D6F-10A5-000	120-4012	174.75	167.56	157.29
0 to 20 l/min	D6F-20A5-000	120-4013	155.34	148.94	139.80
0 to 50 l/min	D6F-50A5-000	120-4015	194.17	186.17	174.75
A6 Type Sensors					
0 to 10 l/min	D6F-10A6-000	NEW 157-3145	186.14	176.06	167.00
0 to 20 l/min	D6F-20A6-000	NEW 157-3146	186.14	176.06	167.00
0 to 50 l/min	D6F-50A6-000	NEW 157-3148	186.14	176.06	167.00
Connecting Cable					
200mm	D6F-CABLE1	120-4016	5.24	4.92	4.67

Thermal Mass Flow Sensor

FS1 Series



Standard

Molded

- Easy adaptable for different applications or into housings
- Simple signal processing and calibration
- Insensitive to contamination
- Excellent reproducibility
- Excellent long-term stability
- Ideal for HVAC, medical devices, food industry etc.
- FS1 and FS1A are used for sensing gases
- FS1L and FS1LA are used for sensing liquids

	Dimensions	Lead Length	Mfrs. List No.	Lead Length
Width	2.4mm	7mm	1.5mm	195mm
Height	6mm	14mm	N/A	174mm
Depth	2.4mm	7mm	0.15mm	195mm
	6mm	14mm	N/A	176mm
Measuring Principle	FS1/FS1A Thermal		FS1L/FS1LA Thermal	
Measuring Range	0.01 to 100 m/s		0.01 to 10 m/s	
Accuracy	<3% current measuring value (dependant on electronic and calibration)		<3% current measuring value (dependant on electronic and calibration)	
Warm Up Time	<1 min (depending on mounting)		<1 min (depending on mounting)	
Response Time	<2 secs (depending on velocity and dT)		<100 ms (depending on velocity and dT)	
Temperature Range	-30 to 150°C		-30 to 150°C	
Temperature Sensitivity	<0.1%/K (dependent on electronic)		<0.1%/K (dependent on electronic)	
Electrical Connection	3 pins, Leads AWG30, insulated with PTFE		3 pins, Leads AWG30, insulated with PTFE	
Heater Reference Element	R _h (0°C) = 45Ω ±0.5%		R _h (0°C) = 45Ω ±0.5%	
Required Voltage	R _s (0°C) = 1200Ω ±0.5%		R _s (0°C) = 1200Ω ±0.5%	
Dielectric Strength	Typical 2 - 5V @ dT = 30 K		Typical 0 - 10V @ dT = 10 K	
	±5 V (! heater rating ! dependent on flow)		±10 V (! heater rating ! dependent on flow)	
Substrate Material	Ceramic			

453906

Mfrs. List No.	Order Code	1+	10+	25+
Gas Sensors				
FS1.0.1L.195	126-6952	7.12	6.47	5.93
FS1.A.1L.195	126-6953	7.94	7.22	6.61
Liquid Sensors				
FS1L.0.1L.195	126-6954	7.12	6.47	5.93
FS1LA.1L.195	126-6955	6.35	5.78	5.29

Microbridge

0 - 0.2 l/min to 0 - 1 l/min



- Sensors give signal-conditioned output proportional to the air/gas flow through the device
- Wide range of applications

Connections
1 Output voltage
2 +ve supply voltage
3 Ground

H = 31.5 (excl pins), W = 20.5 (excl ports), D = 15.5 Port O/D = 5.08, Pin spacing = 2.54, Fixing centres = 12.7

Microbridge mass airflow sensors give a signal conditioned output (1V to 5V dc for a 10V dc supply) proportional to the air/gas flow through the device. They are sensitive to flows up to 1 litre/min (0 - 1000 standards cc's/min). The transducers are uni-directional, the air flow going from P1 to P2.

Applications: Air conditioning (variable air volume), medical ventilation/anaesthesia control, gas analysers, gas metering, fume cabinet and process control.

Excitation voltage	10V dc ±10mV dc
Output voltage	5V at full span
Null voltage	1.00V dc ±50mV dc
Repeatability and hysteresis	±0.5% of reading
Response time	3ms (max.)
Operating temperature	-25°C to +85°C
Overpressure	25 psi

Honeywell

	147-0604	147-0602			
Operating range	0 to 200 sccm (0 to 0.2 litres/min)	0 to 1000 sccm (0 to 1 litre/min)			
Mfrs. List No.	AWM3100V	AWM3300V			
			212424		
Flow Range	Order Code	1+	Price Each	5+	10+
0 to 200 sccm	147-0604	54.61	--	--	--
0 to 1000 sccm	147-0602	54.61	--	--	--

Microbridge

0 - 5 l/min to 0 - 20 l/min



L = 163 (overall), W = 32, D = 35, Fixing centres = 43.2 20.3

- Flow ranges from 0 to 5 litres/min. up to 20 litres/min.
- Device has two 1/4" NPT snap-on fittings enabling simpler connection

Microbridge uni-directional mass airflow sensors featuring higher flow ranges. Electrical connection is via 4-pin connector (3 pins on device), the mating connector being supplied with the sensor.

Applications: Mass flow testing/calibration systems, medical insufflators, environmental sampling equipment, oxygen concentrators and patient monitors.

Excitation voltage	10V dc \pm 10mV dc	Response time	60ms (max.)
Output voltage	5V dc at full span	Operating temperature	-25°C to +85°C
Null voltage	1.00V dc \pm 50mV dc	Overpressure	50 psi
Repeatability and hysteresis	\pm 0.5% of reading	Calibration	Nitrogen N ₂

212167

Flow Range	Mfrs. List No.	Order Code	1+	Price Each	5+	10+	25+
0 to 5 litres/min	AWM5101VN	516-090	129.33	122.84	116.40	110.65	
0 to 10 litres/min	AWM5102VN	516-107	142.26	135.12	128.04	121.71	
0 to 15 litres/min	AWM5103VN	516-119	161.69	153.62	145.53	138.33	
0 to 20 litres/min	AWM5104VN	516-120	129.33	122.29	115.86	110.14	

Mass Air-flow Sensor - AWM 720

H=80, W=37, D=40

- Port Style; Tapered 22mm
- Flow rates upto 200 Standard Litres per minute (SLPM)
- Highly stable null and full scale
- Extremely low hysteresis and repeatability errors, less than 0.35% of reading
- Fast response time, 6ms typical
- Low power consumption, less than 65mW
- Low pressure drop 2.5 cms H₂O at full scale

The AWM 720P1 Microbridge mass air - flow sensor provides inline flow measurement with a specifically designed bypass flow housing

Supply Voltage	8 Vdc min, 15 Vdc max	Span Offset	4 Vdc
Output Voltage	1 - 5V dc	Operating Temperature	-25°C to 85°C
Null Shift over temp	\pm 0.025 Vdc	Media Compatibility	Dry gas only
Output Shift over temp	-2% -25°C to 10°C & +2% 25°C to 40°C	Weight	34g
Null Offset	1V, \pm 0.05 Vdc	Shock	100g peak

248245

Mfrs. List No.	Order Code	1+	Price Each	5+	10+
AWM 720P1	424-5568	110.84	103.08	95.86	

Microbridge - Manifold Mount

H = 30.2 (excl pins),
W (body) = 30.5, F.C. = 34.0
Pressure ports: bore:2.3,
O-ring dia. = 6.2

- Manifold mount/O-ring sealed
- Unamplified sensors have 6-pin bridge output and ceramic flow tube
- Choice of flow range on unamplified sensors: 0 \pm 25 sccm (standard c.c.'s/min.) and 0 \pm 1000 sccm
- Low flow \pm 25 sccm sensor is suitable for hydrogen and helium
- Amplified sensors have 3-pin signal conditioned outputs
- Choice of flow range on amplified sensors: 0 to +1000 sccm with ceramic flow tube and 0 to +6 slpm (standard litres per minute) with plastic flow tube
- Sensors may be used in high common mode pressure range of 150 psi

Mass airflow sensors for manifold mounting, using dual Wheatstone bridge technology for controlling airflow measurement.

	721-6695	721-6713	721-6725
Flow range (full scale)	0 to 25 sccm	0 to +1 litres/min	0 to +6 litres/min
Output voltage (full scale)	8.5 \pm 1.5mV dc	5 \pm 0.15mV dc	5 \pm 0.15mV dc
Null shift	\pm 0.20mV dc	\pm 0.025mV dc	\pm 0.025mV dc
Output voltage shift			

-25°C to +25°C +25°C to +85°C Power consumption (max.) Repeatability and hysteresis Pressure drop (in H ₂ O)	+2.5% reading -2.5% reading 60mW \pm 0.35% reading	-5% reading +6% reading 60mW \pm 0.50% reading 1.02 typ	-5% reading +6% reading 60mW \pm 1.00% reading 8.0 typ
Excitation voltage	10V dc \pm 10mV	Calibration gas	Nitrogen
Operating temperature	-25 to +85°C		

212311

Flow Range	Mfrs. List No.	Order Code	1+	Price Each	5+	10+	25+
Unamplified Sensors							
0 to 25 sccm	AWM42150VH	721-6695	52.88	50.55	47.90	45.54	
Amplified Sensors							
0 to +1 litres/min	AWM43300V	721-6713	68.32	63.54	59.10	54.96	
0 to +6 litres/min	AWM43600V	721-6725	71.37	66.37	61.72	57.40	

Mass Flow Meter - EcoLine EM1SENSIRION
THE SENSOR COMPANY

The Mass Flow Meter enables fast and economical measurement of gas flows over a very wide dynamic range. It is based on Sensirion's unsurpassed CMOSens™ sensor technology which combines a sensor element with the amplification and A/D converter circuit on a single CMOS chip. This results in good performance, fast response time and large dynamic range.

- CMOSens™ technology driven
- Calibrated & temperature compensated
- Digital output signal (RS 232 & SPI)
- Various flow ranges: up to 200 l/min(FS)
- High output data speed (up to 200Hz)
- Wide dynamic range (1:40 with 3% m.v. accuracy)

Flow Range:	Maximum Pressure:
1207226 : EM1(V)	Operating: 8bar
1207227 : EM1(R)	Burst: 40bar
1207228 : EM1(L)	
1399626 : EM1(H)	
Temperature Range:	Electrical Data:
Operating: 0°C - 50°C	Supply voltage range: 7 to 18 V
Dynamic: 0°C - 60°C	Electrical connector: Molex
	Output signal: RS 232 or SPI compliant

337768

Mfrs. List No.	Order Code	1+	Price Each	5+	10+
EM1-VOROV-1N	120-7226	191.14	182.86	165.99	148.25
EM1-ROROV-1N	120-7227	191.14	182.86	165.99	155.25
EM1-LOROV-1N	120-7228	172.02	164.57	149.39	144.79
EM1-HOROV-1N	139-9626	219.51	197.13	186.47	170.50

Mass Flow MeterSENSIRION
THE SENSOR COMPANY**Evaluation Kit EK-F3**

The EK-F3 Evaluation kit offers an easy to use environment to illustrate the unique features of the sensor system and to adapt it to your specific application.

The Kit contents (see list below) include one EM1 meter to the flow rate of your choice, a serial interface cable, various standard fittings for an easy flow connection and a Viewer Software to make the measurement results visible on a PC.

Contents

1. Mass Flow Meter EM1
2. Serial interface cable (sub-D 9pin) with power supply (Euro connector)
3. Legris Flow Connector (No.3101 1217; G3/8; Tube OD=12mm)
4. Hausmann Flow Connector (No. 38.131; G3/8; Tube ID=10mm)
5. Power Adapter for US-style plugs
6. Flow Viewer software on CD

For EM1 Technical Specifications See Order Code 120-7226

337769

Mfrs. List No.	Order Code	Price Each
EK-F3-V	120-7229	371.93
EK-F3-R	120-7230	334.74
EK-F3-L	120-7231	371.93

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Mass Airflow Sensors - continued

Bidirectional Mass Flow Meter
ASF1430SENSIRION
THE SENSOR COMPANY

The Mass Flow Meter enables extremely accurate measurement of fast changing gas flow over 4 orders of magnitude. The performance is based on CMOSens™ sensor technology, which combines a high precision sensor element with the amplification and A/D converter circuit on one single CMOS chip. This results in high resolution, fast response time and a large dynamic range at very low power consumption. All measurement data is fully calibrated and temperature compensated by means of an internal microcontroller.

Mounted in a rugged, chemically inert PBT housing the ASF1430 is suitable for such applications as mass flow metering for process control, medical applications, heating ventilation and air conditioning solutions as well as gas flow metrology.

The sensor housing provides two inlets for measuring the gas flow and withstands overpressures of 2 bar (29 psi). The unit requires a supply voltage of between 7 and 18V dc and provides an RS-232 and SPI compliant electrical interface.

- Total mass flow integrator
- Data rates up to 200 Hz
- Dynamic range 0.01 sccm to 400 sccm
- Calibrated and temperature compensated
- RS-232 and SPI digital interface

Measurement Range: -400 to 400 sccm (bi-directional)
Resolution: 0.1 sccm
Repeatability: 0.0025 % full scale or 0.025 % measured value
Accuracy: 0.05 % full scale or 1 % measured value
Response time: 5 ms (min) to 640ms (max)
Operating temperature: 0 °C to 70 °C

Electrical Data
Supply voltage range: 7 to 18V dc
Input current: 20 mA @ 9 V (typical), 27 mA @ 9 V (max.)
Output signal: RS 232 or SPI compliant

243055

	Order Code	1+	Price Each	10+	25+
Sensor ASF1430	120-7220●	143.73	129.33	122.17	

Liquid Flow Sensors and Flow Switches

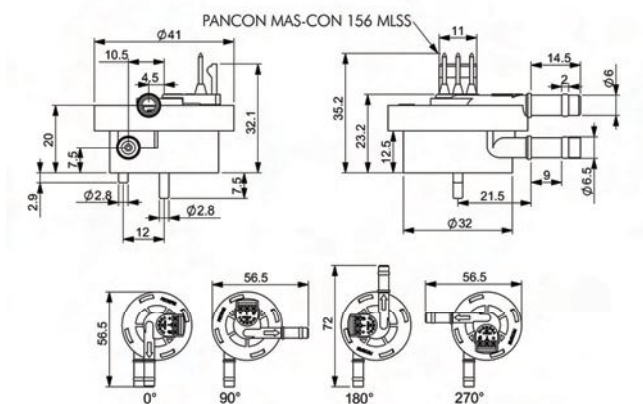
Flowmeter FHKSC

DIGIMESA



The FHKSC Flowmeter is a general-purpose device that has been specially designed for coffee machines that use vibratory pumps. The device is installed between the water container and the vibratory pump (on the suction side) and in this way prevents the measuring errors that arise during pulsation water flow caused by vibratory pumps.

- Thanks to its closure system, the water outlet side can be assembled in four different positions.
- Central sprayed fastening pin \varnothing 2,8 mm x 7,5mm
- Recommended washer disk: Quicklock® Benzing \varnothing 3 mm



Material: PBT 35%GF (Arnite)
Technical data:
Flow rate: 0.041 - 2 l/min due to nozzle size
Measuring accuracy: +/- 2%
Temperature range: -10 bis +65°C
Pressure range: -1 bar to 0.3 bar @ 20°C
Mounting position: Horizontal recommended
Dimensions in mm: L x B x T = 57 x 41 x 35
Electrical connection ratings:
Power supply: 4.5 - 24V dc
Signal connection: Open collector NPN

381860

Description	Type	Order Code	1+	Price Each	5+	10+	25+
FLOWMETER FHKSC ARNITE	932-8506	854-4700	12.44	11.88	11.58	10.83	

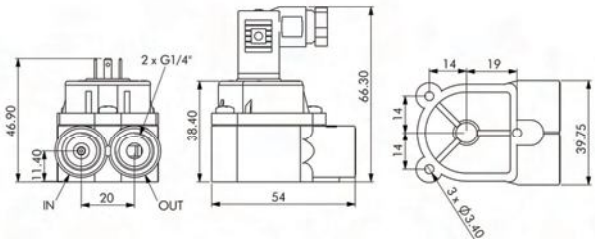
Flowmeter FHK G1/4" PVDF

DIGIMESA



The FHK Flowmeter is a general-purpose device; its working range can be individually defined according to its nozzle size. It is employed for measuring, regulating or metering and guarantees most precise measurement of fluid quantities. In addition, a pulse generator integrated into the flowmeter guarantees a practically unlimited useful life.

- High temperatures
- Good resistance to chemicals
- Compact design
- High measuring range due to nozzle size
- Employed in the semiconductor (wafer polishing) sector due to the high purity of materials used



Material: PVDF
Housing
Technical data:
Flow rate: 0.048 - 5 l/min due to nozzle size
Measuring accuracy: +/- 2%
Temperature range: -10 bis +100°C
Pressure range: 20 bar @ 20°C

Mounting position: Horizontal recommended
Dimensions in mm: L x B x T = 54 x 40 x 47
Electrical connection ratings:
Power supply: 4.5 - 24V dc
Consumption: 5mA bis max.13mA
Signal connection: Open collector NPN

381875

Description	Type	Order Code	1+	Price Each	5+	10+
FLOWMETER FHK G1/4" PVDF	937-1333/C014	854-4727	64.01	61.33	60.20	

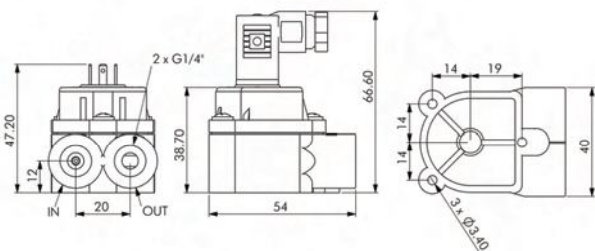
FHK G1/4" Arnite flowmeter

DIGIMESA



- Input and output on the same side
- Compact size

The FHK flowmeter is a universally useable flowmeter, and the measurement range can be determined by the nozzle size. It is used for measurement, control or metering. Ensures very accurate flowrate measurements. The electronic pulse transmitter integrated in the flowmeter also guarantees a virtually unrestricted life.



381877/436276

Description	Type	Order Code	1+	Price Each	5+	10+
FLOWMETER FHK G1/4" ARNITE	937-1533/01	854-4719	32.00	29.01	28.37	

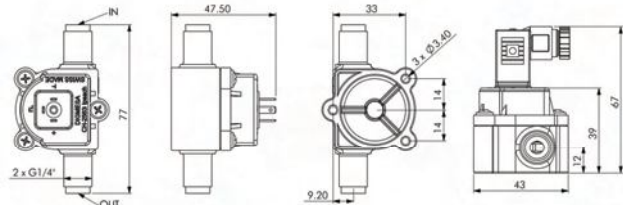
FHKU G1/4" Arnite flowmeter

DIGIMESA



The FHKU flowmeter is a universally useable flowmeter, and the measurement range can be individually determined by the nozzle size. It is used for measurement, control or metering. Ensures very accurate flowrate measurements. The electronic pulse transmitter integrated in the flowmeter also guarantees a virtually unrestricted life.

- Linear input and output
- Compact size



381878/436278

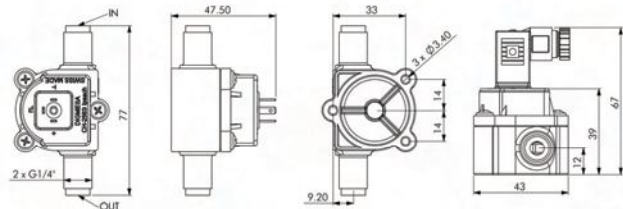
Description	Mfrs. List No.	Order Code	1+	5+	10+
FLOWMETER FHKU G1/4\" ARNITE	938-1556/01	854-4735	44.08	40.87	39.96

Flowmeter FHKU G1/2\" Arnite



The FHKU Flowmeter is a general-purpose device; specially for higher throughputs of up to approx. 30 l/min. It is employed for measuring, regulating order metering and guarantees most precise measurement of fluid quantities. In addition, a pulse generator integrated into the flowmeter guarantees a practically unlimited useful life.

- Linear inlet and outlet
- Compact design
- High measuring range due to nozzle size



Material:
Housing PBT 35%GF (Arnite)

Technical Data:
Flow rate 3 - 30 l/min
Measuring accuracy +/- 2%
Temperature range -10 bis +65°C
Pressure range 20 bar @ 20°C

Mounting position
Dimensions in mm
Horizontal recommended L x B x T = 75 x 43 x 48

Electrical connection ratings:
Power supply 4.5 - 24V dc
Consumption 5mA bis max.13mA
Signal connection Open collector NPN

381879

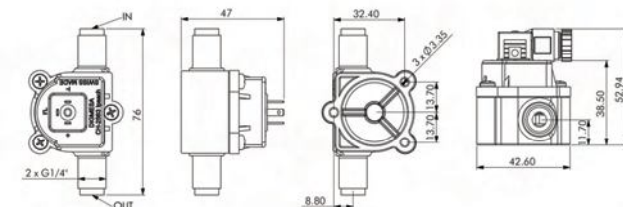
Description	Type	Order Code	1+	5+	10+
FLOWMETER FHKU G1/2\" ARNITE	938-6500/01	854-4743	44.08	40.87	39.96

Flowmeter FHKU G1/4\" PVDF



The FHKU Flowmeter is a general-purpose device; specially for higher throughputs of up to approx. 30 l/min. It is employed for measuring, regulating order metering and guarantees most precise measurement of fluid quantities. In addition, a pulse generator integrated into the flowmeter guarantees a practically unlimited useful life.

- High temperatures
- Good resistance to chemicals
- Linear inlet and outlet
- Compact design
- High measuring range due to nozzle size
- Employed in the semiconductor (wafer polishing) sector due to the high purity of materials used



Material:
Housing PVDF

Technical data:
Flow rate 0.041 - 15l/min
Measuring accuracy +/- 2%
Temperature range -10 bis +100°C
Pressure range 20 bar @ 20°C

Mounting position
Dimensions in mm
Horizontal recommended L x B x T = 76 x 43 x 47

Electrical connection ratings:
Power supply 4.5 - 24V dc
Consumption 5mA bis max.13mA
Signal connection Open collector NPN

381880

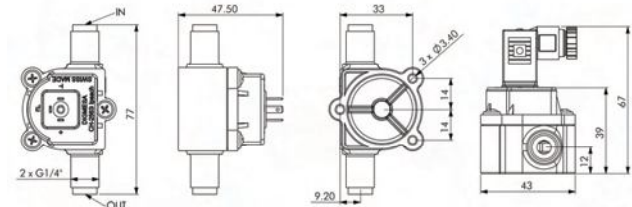
Description	Type	Order Code	1+	5+	10+
FLOWMETER FHKU G1/4\" PVDF	938-1356/C014	854-4751	47.07	44.02	43.05

Flowmeter FHKU G1/2\" PVDF



The FHKU Flowmeter is a general-purpose device; specially for higher throughputs of up to approx. 30 l/min. It is employed for measuring, regulating order metering and guarantees most precise measurement of fluid quantities. In addition, a pulse generator integrated into the flowmeter guarantees a practically unlimited useful life.

- High temperatures
- Good resistance to chemicals
- Linear inlet and outlet
- High throughput at low loss of pressure
- Employed in the semiconductor (wafer polishing) sector due to the high purity of materials used



Material:
Housing PVDF

Technical Data:
Flow rate 3 - 30l/min
Measuring accuracy +/- 2%
Temperature range -10 bis +100°C
Pressure range 20 bar @ 20°C

Mounting position
Dimensions in mm
Horizontal recommended L x B x T = 75 x 43 x 48

Electrical connection range:
Power supply 4.5 - 24V dc
Consumption 5mA bis max.13mA
Signal connection Open collector NPN

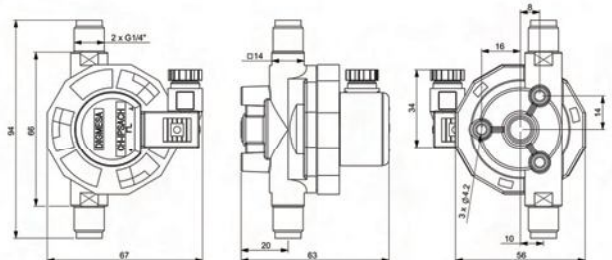
381881

Description	Type	Order Code	1+	5+	10+
FLOWMETER FHKU G1/2\" PVDF	938-6300/C014	854-4760	74.65	69.81	68.27

Flowmeter FFG 40 Arnite



The FFG 60 Flowmeter is a general-purpose device; its working range can be individually defined according to the nozzle size. It is employed for measuring and guarantees most precise measurement of fluid quantities. In addition, a pulse generator integrated into the flowmeter guarantees a practically unlimited useful life. The Flowmeter is successfully employed in dispensing equipments and premix equipments. It measures spiritous beverages as precise as chemical aggressive media and because of that it is used in different industries.



Material:
Housing PBT 35%GF (Arnite)

Technical Data:
Flow rate 0.22 - 7.75l/min
Measuring accuracy +/- 2%
Temperature range -10 bis +65°C
Pressure range 5.5 bar @ 20°C

Mounting position
Nozzle size
Dimensions in mm
Horizontal recommended \varnothing 4.0mm
L x B x T = 94 x 56 x 64

Electrical connection ratings:
Power supply 4.5 - 24V dc
Consumption 5mA bis max.13mA
Signal connection Open collector NPN

381882

Description	Type	Order Code	1+	5+	10+	25+
FLOWMETER FFG 40 ARNITE	934-2540	854-4778	62.26	57.66	56.43	52.69

Flowmeter FFG 60 PVDF

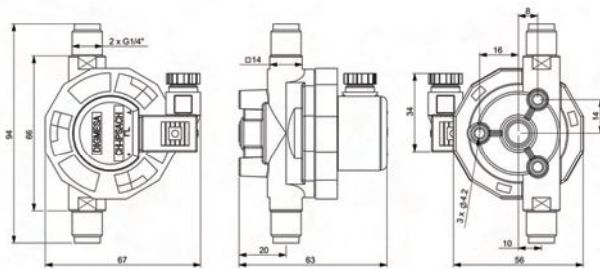


The FFG 60 is a general-purpose device. It is employed for measuring, regulating or metering and guarantees most precise measurement of fluid quantities. In addition, a pulse generator integrated into the flowmeter guarantees a practically unlimited useful life.

- High Temperatures
- Good resistance to chemicals
- Compact design
- Linear inlet and outlet
- Employed in the semiconductor (wafer polishing) sector due to the high purity of materials used

Liquid Flow Sensors and Flow Switches - continued

Flowmeter FFG 60 PVDF - continued



Material:	PVDF	Mounting position	Horizontal recommended
Housing		Dimensions in mm	L x B x T = 94 x 56 x 63
Technical Data:		Electrical connection ratings:	
Flow rate	0.021 - 15.75/min	Power supply	4.5 - 24V dc
Measuring accuracy	+/- 2%	Consumption	5mA bis max. 13mA
Temperature range	-10 bis +100°C	Signal connection	Open collector NPN
Pressure range	5.5 bar @ 20°C		

381888

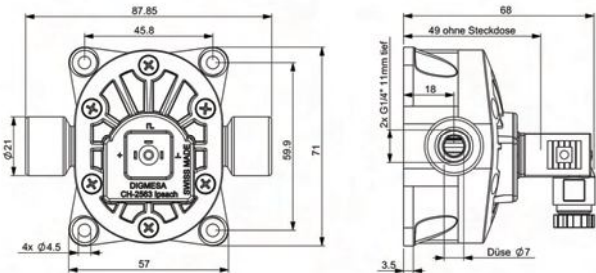
Description	Type	Order Code	1+	5+	10+	25+
FLOWMETER FFG 60 PVDF	934-2360	854-4786	130.13	120.57	117.94	113.85

EPI PP flowmeter



The EPI flowmeter is particularly suitable for flowrate measurement of highly viscous liquid media such as syrup, oil or concentrated detergents. Because of its special design and the epicycloid vanes, the EPI flowmeter has high precision and allows very accurate quantity metering with very little pressure loss.

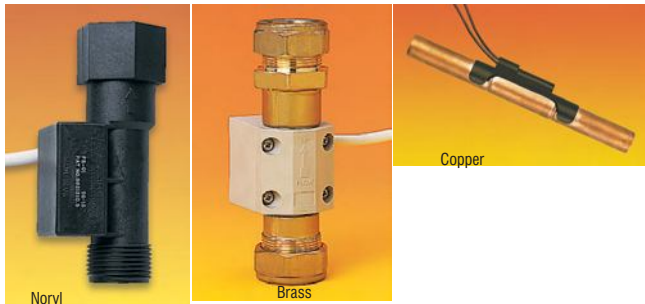
- Highly viscous media
- High temperatures
- High flowrate with a low pressure loss and good resistance to chemicals



381890/436290

Description	Type	Order Code	1+	5+	10+	25+
FLOWMETER EPI PP	930-0901/V01	854-4794	150.77	140.18	137.10	128.09

Liquid and Air Flow Switches



- Operates from a small head of liquid
- Maximum pressure 10 Bar @ 20°C
- Low pressure drop
- Vertical mount ±15°
- Suitable for various pipe sizes
- Triac switching (AC)
- Reed Switch switching (DC)
- Suitable for liquid and air

Typical Sensing Applications

- Power shower
- Central heating systems
- Mains water control
- Flow sensing
- Leak detection
- Cooling systems

	100-6766	100-6767	100-6768	100-6771	100-6772
Switching voltage	250V rms	300V dc	250V ac	300V dc	300V dc
Contract	Form A - Triac	Form A - SPST	Form A - Triac	Form A - SPST	Form A - SPST
Switching current	3A	1A	3A	1A	1A
Switching power		15W		15W	15W
Material	Noryl	Noryl	Brass	Brass	Copper
Temperature	-30°C to +100°C	-30°C to +85°C	-30°C to +100°C	-30°C to +100°C	-30°C to +80°C
Flow Rate	1/min	1/min	1/min	1/min	0.5litre / minute
Fitting	3/4" BSP	3/4" BSP Male/Female	22mm compression	22mm compression	15mm pipe

233632

Connection Type	Mfrs. List No.	Order Code	1+	Price Each	10+	25+
3/4" BSP	FS-01	100-6766	18.06	16.58	15.05	
3/4" BSP Male/Female	FS-02	100-6767	13.16	12.10	10.99	
22mm compression	FS-05	100-6768	27.10	25.65	24.34	
22mm compression	FS-06	100-6771	32.03	29.74	28.22	
15mm pipe	FS-10	100-6772	7.21	6.77	6.32	

Liquid Flow Switches

1.5ℓ/min and 3.5ℓ/min



- Flow switches in Acetal resin housing, WRC approved for use in potable water systems
- Suitable for use with hot or cold water and alcohol or dilute (including organic) acids up to 5% concentration
- Flow switches can be mounted vertically or horizontally, with the cap upwards

15mm types: L=107, W=56 (standard type), Dia.=15, Cable L=250

22mm types: L=114, W=58 (standard type), Dia.=22, Cable L=250

Available 15mm and 22mm diameter for 1.5 litre/min and 3.5 litre/min flows respectively. Greater sensitivity is achieved with vertical installation.

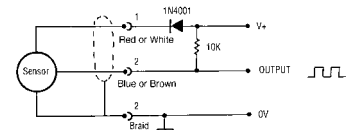
Switch point	1.2 to 1.5/min (15mm types), 3.0 to 3.5/min (22mm types)
Switch off flow (max.)	0.5 litres/min. (15mm types), 1.0 litres/min. (22mm types)
Operating temperature	85°C (max.)
Switching voltage	240V rms/dc
Max. full cycle on state surge	1.0A @ 50Hz (standard types)
Max. full cycle continuous	1.0A @ 50Hz (standard types)
Max. switching power	15VA (standard types)

212420

	Mfrs. List No.	Order Code	1+	Price Each	10+	50+
1.5 ℓ/min, 15VA	FS15	730-889	12.01	11.04	10.03	
3.5 ℓ/min, 15VA	FS22	730-890	12.59	11.66	10.57	

Liquid Flow Sensor

0.05 - 1.67ℓ/min.



H=78, W=32.5, D=27, Lead L=1.9 metres

- Ideal for use with water, petrol etc.
- Bi-directional inlet and outlet
- Use for flow ratio measurement, flow safety, automotive applications etc.

This accurate flow sensor uses Hall effect technology to give a variable frequency pulsed output proportional to the liquid flow rate. The sensor has a POM (Hostaform C) and stainless steel housing, and accepts hoses of either 6mm or 8mm inside diameter. Connection is via a 2 core, screened cable supplied connected to the unit.

Flow range	3 to 100 litres/hour	Sensor to sensor variation	±5%
Output frequency	22Hz @ 10 litres/hour	Power supply	4.5 to 24V (V _{CC})
	133Hz @ 60 litres/hour		
Viscosity range	0.8 to 10 centistokes	Output	100mV to V _{CC}
Design pressure	10 Bar	Current consumption	20mA
Signal reproducibility	±1%	Temperature range	-25°C to +85°C

212431

Order Code	1+	5+	Price Each	10+	25+
178-923	86.83	78.87	72.10	65.12	

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Water and Air Flowmeters - 'Loflow'



- Gives accurate indication of low rates of fluid flow
- Easy wall or panel mounting



'Loflow' flowmeters use the principle of variable area flow measurement, utilising the movement of a float inside a calibrated tapered tube. The float is displaced upwards with increasing flow rate until the weight of the float balances the upward force of the fluid. The top of the float then indicates the flow rate on the calibrated scale.

Construction:	Grillon-TR55
Body	ABS 7020
Black body half/ball retainer	PVC
Black panel	10 bar
Max. working pressure	60°C
Max. working temperature	±2%
Accuracy	±1%
Repeatability	

Media	Inlet Port	Flow Rate	Float Material	Order Code
Water	3/4"BSPT Male	0.2-2	Acetal	541-266
Water	3/4"BSPT	1.5-10	Stainless Steel	541-278
Water	3/4"BSPT	2-22	Stainless Steel	541-280
Air	1/4" BSPT (male)	1.0-7.5	Acetal	731-092
Air	1/4" BSPT (male)	3-21	Stainless Steel	731-109
Air	3/4"BSPT	5-50	Acetal	731-110
Air	3/4"BSPT	20-135	Acetal	731-122
Air	3/4"BSPT	60-720	Stainless Steel	731-146

Note: These units must be used in the vertical plane

224716

Flow Range (Litres/min)	Mftrs. List No.	Order Code	1+	5+	10+	25+
Water						
0.2-2	LF.2020	541-266	55.63	51.29	49.44	43.52
1.5-10	LF.211	541-278	55.63	51.29	49.41	43.52
2-22	LF.2220	541-280	55.63	51.29	49.41	43.52
Air						
1.0-7.5	LF3007E	731-092	45.52	43.68	42.09	38.72
3-21	LF3021E	731-109	464.95	452.39	440.48	429.19
5-50	LF3050E	731-110	55.63	51.29	49.41	43.52
20-135	LF3135E	731-122	55.63	51.29	49.41	43.52
60-720	LF3720E	731-146	55.63	51.29	49.41	43.52

Water Flow Meters - 'Easiflow'

1 to 100 l/min.



- Calibrated specifically for use with water
- Suitable for installation in any plane
- Flow rate indicated on viewing window
- Wide range of flow rates available, either indication only or with switching facility from either ac or dc supply



'Easiflow' flowmeters use the principle of difference pressure to give a positive and repetitively accurate indication of flow rate on the calibrated scale.

Construction:	Polyester	Connections	1" BSP (female)
Body	Borosilicate glass	Max. working pressure	10 bar
Viewing area	Acetyl	Temperature range	+5°C to +80°C
Cone	Stainless Steel	Viscosity range	10 to 200 centistokes
Spring	Nitrile	Accuracy	±5% f.s.d.
Seal	Nitrile	Repeatability	±1% f.s.d.
Dimensions (mm)	H (overall) = 196, Ø = 60		

224717

Flow Range (Litres/min)	List No.	Order Code	1+	5+	10+	25+
Flowmeters						
1 to 15	EFW.0152	541-291	111.23	107.36	103.92	94.44
2 to 30	EFW.0302	541-308	109.15	104.75	101.37	92.14
4 to 50	EFW.0502	731-160	105.37	101.71	98.44	92.22
5 to 100	EFW.1002	541-310	111.23	107.36	103.92	94.44

Flow Transducers

Compact, Pulse Output

1 - 25 l/min.



'Dataflow Compact' is for monitoring low flows of liquids with an electronic output signal at low cost. Fluid impacts on a twin-vaned turbine which rotates at a speed proportional to the flow rate. The rotation is detected optically and converted to a pulse output signal suitable for display or control of flow rate, totalising or batch control.

Electrical connections, 3 wire
H = 29, W = 52 overall, D = 27
Red = +5V
Green = output signal
Blue = 0V
Connections: 3/8" BSP
Cable L = 300



- Pulse output signal for flows up to 25 l/min.
- Lightweight, robust and suitable for most liquids
- Operates in any plane
- Simple to install
- Negligible pressure drop
- Accepts reverse flow
- Low cost flow measurement

Construction	Grillon-TR55	Shaft retainers	Grilamid - TR55
Body	18% PTFE filled nylon	Max. working pressure	20 bar
Rotor	Stainless Steel	Pressure drop (max.)	0.1 bar @ 15l/min.
Shaft			
Calibration		Temperature range	+5°C to +70°C
'K' Factor	752 pulses/litre	Power supply	+5V dc
Accuracy	±2% typ.	Flow range	1 to 25 l/min.
Repeatability	±1%		

212177

Mftrs. List No.	Order Code	1+	5+	10+	25+
DFC.9000	560-121	43.58	42.72	41.33	38.94

4-20mA or 'Pulse' Output - 'Dataflow'
Flow Rates Up To 150l/min.

H=100, W=42, L=196
Connections: 1" BSP, parallel threads

- 4 to 20mA or pulse output types available
- Works in any plane
- Accepts reverse flow
- Simple to install
- For use with most liquids

Connections	560-108	560-110
	1 +20mA	1 Signal +
	2 +24V	2 +24V
	3 No pin	3 Signal -
	4 0V, 0mA	4 0V GND

'Dataflow' flow transducers are designed to operate with most liquids. The transducer is available with either 4 to 20mA output or pulse output.

The 4 to 20mA output type is factory calibrated to 4 to 100 litres/minute, but this can be easily user recalibrated using the zero and span adjusters on the unit.

The pulse output type is factory calibrated but is not user adjustable. It can be used in conjunction with a totaliser or batch counter.

Construction	Polyester	Calibration	560-108: 4mA - 0l/min., 20A - 100l/min.
Body	Borosilicate	560-110: 'K' Factor, Water - 44.25 pulses/litre	
Glass tube	Acetal	Oil (viscosity 30cSt) - 51.14 pulses/litre	
Rotor and locator	Nitrile		
Seals	Stainless Steel		
Washers and shaft	Stainless Steel		
Rotor tips	Stainless Steel		

Max. working pressure	10bar oil/water	Temperature range	+5°C to +80°C oil +5°C to +60°C water
Max. flow rate	150l/min.	Accuracy	±2%
Min. flow indication	2l/min. (max. 150l/min.)	Supply	24V dc

Mftrs. List No. DFT.990=560-108, DFT.980=560-110

FOR SUITABLE 4 TO 20mA PROCESS INDICATOR, SEE ORDER CODE 118-6900 OR 993-3069.

222139

Output	Order Code	1+	5+	10+
4 to 20mA	560-108	347.22	324.97	314.53
Pulse	560-110	347.22	324.97	314.53

Encoders - Incremental

EM14 Series - Rotary Optical Encoder with Switch



- HCMOS, CMOS and TTL compatible
- Compact package size
- High rotational cycle life
- Standard or high force push switch option
- Optional detent
- Splashproof shaft seal
- Recommended for human/machine interface applications (HMI)
- Cable/connector option
- Optional bracket

Voltage rating	5V dc
Maximum operating speed	120 rpm
Rotational life	1000000 Cycles (Non-Detent) 1000000 Cycles (Detent)

Operating temperature

-40°C to 70°C

Pulses Per Revolution	Detents	Switch Option	Mftrs List No.	Order Code
32	No Detent	Push Switch	EM14A0D-C24-L032S	147-0245
32	No Detent	No Switch	EM14A0D-C24-L032N	147-0246
8	32	Push Switch	EM14A1D-C24-L008S	147-0247
64	No Detent	Push Switch	EM14A0D-C24-L064S	147-0248
64	No Detent	No Switch	EM14A0D-C24-L064N	147-0249

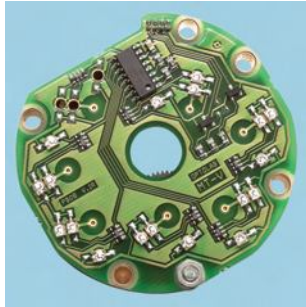


Encoders - Incremental - continued

EM14 Series - Rotary Optical Encoder with Switch - continued

488862

Mfrs. List No.	Order Code	1+	5+	10+	Price Each
EM14A0D-C24-L032S	147-0245●	19.67	17.71	16.73	
EM14A0D-C24-L032N	147-0246●	18.44	16.59	15.68	
EM14A1D-C24-L008S	147-0247●	20.91	18.82	17.78	
EM14A0D-C24-L064S	147-0248●	19.67	17.71	16.73	
EM14A0D-C24-L064N	147-0249●	18.44	16.59	15.68	

Multi-turn Encoder Module
Multiplexed Output

The AEAT-84AD provides all function as an optoelectronic-mechanical unit in order to implement, with single turn absolute encoder, an absolute multi-turn encoder with a combined capacity of up to 30 bits at extended temperature.

The unit consists of an IR-LED circuit board, a phototransistor (PT) circuit board, and 6 or 7 gear wheels arranged in between the PCB's.

Operating Temperature	Supply Voltage
-40 to 125°C	5.0 to 5.5V dc

428913

Resolution	Mfrs. List No.	Order Code	1+	5+	10+	25+	50+	Price Each
14 bit	AEAT-84AD-LBSFO	116-1065●	53.97	51.97	50.12	48.39	46.78	

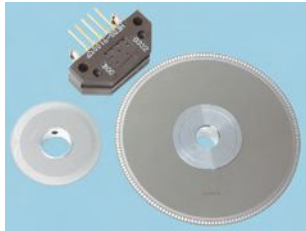
Ultra Miniature, High Resolution
Incremental Kit Encoders

- Three channel output (A & B output with index channel)
- Resolution options from 600 to 4096 cycles per revolution (CPR), up to 16384 counts with 4X decoding
- Cost effective
- -40 to 125°C operating temperature
- Ultra miniature size (Ø17mm)
- Maximum 1 MHz operating frequency
- Maximum 12000 RPM rotational speed
- Single 5V supply
- Integrated RS422 differential line driver
- Integrated bearing stage for easy mounting
- Bottom-up or top-down mounting options

CPR	Counts After X4 Decoding	Mfrs. List No.	Order Code
Bottom Mounting			
1024	4096	AEDA-3300-BA7	116-1068
4096	16384	AEDA-3300-BAT	116-1073
Top Mounting			
1024	4096	AEDA-3300-TA7	116-1077
3000	12000	AEDA-3300-TAM	116-1080
4096	16384	AEDA-3300-TAT	116-1083

442736

Mfrs. List No.	Order Code	1+	5+	10+	25+	50+	Price Each
Bottom Mounting							
AEDA-3300-BA7	116-1068●	35.53	34.22	32.99	31.85	30.80	
AEDA-3300-BAT	116-1073●	33.18	31.94	30.82	29.74	28.76	
Top Mounting							
AEDA-3300-TA7	116-1077●	43.28	41.67	40.19	38.80	37.52	
AEDA-3300-TAM	116-1080●	47.37	45.62	43.99	42.47	41.07	
AEDA-3300-TAT	116-1083●	47.37	45.62	43.99	42.47	41.07	

Two Channel Optical Incremental Encoder
Module Bundle with Codewheel

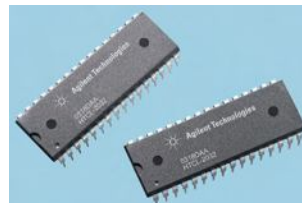
- High performance
- Resolution from 96 CPR up to 1000 CPR (Counts Per Revolution)
- Low cost
- Easy to mount
- No signal adjustment required
- Small size
- Operating temperature: -40 to 100°C
- TTL compatible
- Two channel quadrature output
- Single 5V supply

CPR	Shaft Size	Codewheel Rop	Mfrs. List No.	Order Code
HEDB9100 Series				
100	6mm	11.00mm	HEDB-9100-C12	116-1122
512	8mm	11.00mm	HEDB-9100-I13	116-1132

442843

Mfrs. List No.	Order Code	1+	5+	10+	25+	50+	Price Each
HEDB-9100-C12	116-1122●	19.80	19.07	18.39	17.75	17.16	
HEDB-9100-I13	116-1132●	19.80	19.07	18.39	17.75	17.16	

Quadrature Decoder/Counter Interface IC's



- Interfaces encoder to microprocessor
- 33 MHz clock operation
- Programmable count modes (1x, 2x or 4x)
- Single or dual axis support
- Index channel support
- High noise immunity
- Schmitt trigger inputs and digital noise filter
- 32-bit binary up/down counter
- Latched outputs
- 8-bit tristate interface

- 8, 16, 24 and 32-bit operating modes
- Quadrature decoder output signals up/down and count
- Cascade output signals, up/down and count
- Substantially reduced system software
- 5 V operation ($V_{DD} - V_{SS}$)
- TTL/CMOS compatible I/O
- Operating temperature: -40 to 100°C
- 32-pin PDIP or 20-pin PDIP

442860

Mfrs. List No.	Order Code	1+	5+	10+	25+	50+	Price Each
HCTL-2022	116-1110●	6.64	5.97	5.42	4.74	4.38	
HCTL-2032	116-1111●	9.94	8.95	8.15	7.12	6.56	

Quick Assembly Two and Three Channel
Optical Encoder

- Two channel quadrature output with optional index pulse
- Quick and easy assembly
- No signal adjustment required
- Low cost
- Resolutions up to 512 counts per revolution
- Small size
- -40 to 100°C operating temperature
- TTL compatible
- Single 5V supply

Channel	CPR	Shaft Size	Mfrs. List No.	Order Code
HEDM55xx Series				
2		8mm	HEDM-5500#B13	116-1163
HEDM5500 Series				
2		3mm	HEDS-5500#A02	116-1181
2	500	3.175mm	HEDS-5500#A03	116-1182
2	500	4mm	HEDS-5500#A11	116-1184
2	500	6mm	HEDS-5500#A12	116-1185
2	100	5mm	HEDS-5500#C14	116-1189
2	512	6.35mm	HEDS-5505#I06	116-1202
3		2mm	HEDS-5540#A01	116-1203
3		3mm	HEDS-5540#A02	116-1204
3		5mm	HEDS-5545#A14	116-1208
2		6.35mm	HEDS-5600#C06	116-1211
2		6.35mm	HEDS-5605#A06	116-1213
3		8mm	HEDS-5645#G13	116-1218

442936

Mfrs. List No.	Order Code	1+	5+	10+	25+	50+	Price Each
HEDM-5500#B13	116-1163●	31.82	30.63	29.54	28.52	27.57	
HEDS-5500#A02	116-1181●	32.71	31.49	30.36	29.32	28.35	
HEDS-5500#A03	116-1182●	31.82	30.63	29.54	28.52	27.57	
HEDS-5500#A11	116-1184●	32.71	31.49	30.36	29.32	28.35	
HEDS-5500#A12	116-1185●	32.71	31.49	30.36	29.32	28.35	
HEDS-5500#C14	116-1189●	31.82	30.63	29.54	28.52	27.57	
HEDS-5505#I06	116-1202●	31.82	30.63	29.54	28.52	27.57	
HEDS-5540#A01	116-1203●	29.50	28.41	27.39	26.44	25.56	
HEDS-5540#A02	116-1204●	34.04	32.78	31.61	30.52	29.50	
HEDS-5545#A14	116-1208●	34.04	32.78	31.61	30.52	29.50	
HEDS-5600#C06	116-1211●	32.71	31.49	30.36	29.32	28.35	
HEDS-5605#A06	116-1213●	32.71	31.49	30.36	29.32	28.35	
HEDS-5645#G13	116-1218●	34.04	32.78	31.61	30.52	29.50	

Mid-Sized Housed Encoder



- Two channel quadrature output
- Quick and easy assembly
- Cost-effective
- Ideal for small motor systems
- -10 to 85°C operating temperature
- Hub available in either a set screw configuration or a press fit adhesive mount configuration
- Right angle connector available

Channel	CPR	Shaft Size	Mfrs. List No.	Order Code
Set Screw Mounting				
2		2mm	HEDR-5420-ES201	116-1164
2		4mm	HEDR-5420-ES211	116-1168
2		5mm	HEDR-5420-ES214	116-1169
Press-fit Mounting				
2		4mm	HEDR-5421-EP111	116-1170

442941

Mfrs. List No.	Order Code	1+	5+	10+	25+	50+
HEDR-5420-ES201	116-1164	11.03	10.61	10.23	9.88	9.56
HEDR-5420-ES211	116-1168	12.25	11.79	11.37	10.98	10.62
HEDR-5420-ES214	116-1169	12.59	12.12	11.69	11.29	10.92
HEDR-5421-EP111	116-1170	9.02	8.68	8.37	8.09	7.83

Three Channel Optical Incremental Encoder Module with Codewheel



- Two channel quadrature output with index pulse
- Resolution from 100 to 500 CPR (Counts Per Revolution)
- Low cost
- Easy to mount
- No signal adjustment required
- Small size
- -10 to 85°C operating temperature
- TTL compatible
- Single 5V supply

CPR	Shaft Size	Codewheel Rop	Mfrs. List No.	Order Code
500	6.35mm	11.00mm	AEDB-9140-A06	116-1085
500	6mm	11.00mm	AEDB-9140-A12	116-1086
500	8mm	11.00mm	AEDB-9140-A13	116-1087
500	5mm	11.00mm	AEDB-9140-A14	116-1089
360	6.35mm	11.00mm	AEDB-9140-G06	116-1094

442943

Mfrs. List No.	Order Code	1+	5+	10+	25+	50+
AEDB-9140-A06	116-1085	15.390	14.810	14.270	13.800	13.340
AEDB-9140-A12	116-1086	20.110	19.360	18.660	18.030	17.430
AEDB-9140-A13	116-1087	18.100	17.420	16.790	16.230	15.690
AEDB-9140-A14	116-1089	14.860	14.320	13.938	13.621	13.318
AEDB-9140-G06	116-1094	17.420	16.790	16.180	15.630	15.100

Reflective Surface Mount Optical Encoder



- Reflective technology
- Surface mount small outline leadless package
- Single channel incremental output
- Two channel quadrature outputs for direction sensing
- TTL compatible output
- Single 5V supply
- -20 to 85°C absolute operating temperature

No. of Channels	LPI	Mfrs. List No.	Order Code
2	75	AEDR-8300-1K2	116-1101
2	150	AEDR-8300-1P2	116-1102
2	180	AEDR-8300-1Q2	116-1103
1	75	AEDR-8310-1K2	116-1105
1	36	AEDR-8310-1V2	116-1107

442950

Mfrs. List No.	Order Code	1+	5+	10+	25+	50+
Two Channel						
AEDR-8300-1K2	116-1101	2.29	2.20	2.12	2.05	1.98
AEDR-8300-1P2	116-1102	2.29	2.20	2.12	2.05	1.98
AEDR-8300-1Q2	116-1103	2.29	2.20	2.12	2.05	1.98
One Channel						
AEDR-8310-1K2	116-1105	1.46	1.41	1.36	1.31	1.26
AEDR-8310-1V2	116-1107	2.23	2.14	2.06	2.00	1.93

Reflective Surface Mount Optical Encoder



- Reflective technology
- Surface mount small outline leadless package
- Direct replacement of HEDR-8000 encoder
- Single channel incremental output
- Two channel quadrature outputs for direction sensing
- TTL compatible output
- Single 5V supply
- -20 to 85°C absolute operating temperature
- Lead free package

PCB Thickness	No. of Channels	LPI	Mfrs. List No.	Order Code
1.5mm	2		AEDR-8000-1K2	116-1097
1.5mm	2	150	AEDR-8100-1P2	116-1099
1.5mm	2	180	AEDR-8100-1Q1	116-1100

442951

Mfrs. List No.	Order Code	1+	5+	10+	25+	50+
AEDR-8000-1K2	116-1097	6.35	6.11	5.89	5.69	5.50
AEDR-8100-1P2	116-1099	6.17	5.94	5.73	5.53	5.35
AEDR-8100-1Q1	116-1100	6.17	5.94	5.73	5.53	5.35

Three Channel Optical Incremental Encoder Module



- Two channel quadrature output with index pulse
- Resolution up to 1000 CPR (Counts per Revolution)
- Low cost, easy to mount
- No signal adjustment required
- Small size
- -40 to 100°C operating temperature
- TTL compatible
- Single 5V supply

no. of Channels	Mfrs. List No.	Order Code
3	HEDS-9040#B00	116-1235
3	HEDS-9140#100	116-1240

442953

Mfrs. List No.	Order Code	1+	5+	10+	25+	50+
HEDS-9040#B00	116-1235	17.23	16.59	16.00	15.45	14.94
HEDS-9140#100	116-1240	13.41	12.91	12.45	12.02	11.62

Encoder Line Drivers



- Available on encoder kit housing (HEDM-5500 Series)
- Complementary outputs
- Industry standard line driver IC
- Single 5V supply
- Onboard bypass capacitor
- Operating temperature up to 70°C

No. of Channels	CPR	Shaft Diameter	Mfrs. List No.	Order Code
2	1000	8mm	HEDL-5560#B13	116-1148

442958

Mfrs. List No.	Order Code	1+	5+	10+	25+	50+
HEDL-5560#B13	116-1148	39.72	38.24	36.88	35.61	34.42

Two Channel Codewheel



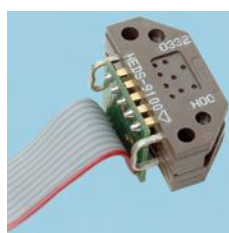
- Cost effective
- Resolutions from 100 to 1024 CPR
- For use with HEDS-90xx/91xx Series two channel encoders

Shaft Diameter	Mfrs. List No.	Order Code
5mm	HEDS-5120#C14	116-1172
6.35mm	HEDS-5120#G06	116-1173
6.35mm	HEDS-5120#I06	116-1175
15.875mm	HEDS-6100#B10	116-1224
12.7mm	HEDS-6140#B09	116-1227

442960

Mfrs. List No.	Best.-Nr.	1+	5+	10+	25+	50+
HEDS-5120#C14	116-1172	16.120	14.500	13.180	11.510	10.630
HEDS-5120#G06	116-1173	10.030	9.030	8.210	7.170	6.762
HEDS-5120#I06	116-1175	12.050	10.840	9.860	8.600	7.940
HEDS-6100#B10	116-1224	21.500	19.340	17.580	15.360	14.180
HEDS-6140#B09	116-1227	33.920	30.530	27.750	24.240	22.370

Two Channel High Resolution Optical Incremental Encoder Module



- High resolution: up to 1024 CPR
- Two channel quadrature output
- Low cost
- Easy to mount
- No signal adjustment required
- Small size
- -40 to 100°C operating temperature
- TTL compatible
- Single 5V supply

Codewheel ROP	No. of Channels	CPR	Mfrs. List No.	Order Code
23.36mm	2		HEDS-9000#B00	116-1233
11.00mm	2		HEDS-9100#C00	116-1236
11.00mm	2	LPI	HEDS-9200#300	116-1241
11.00mm	2		HEDS-9200#360	116-1242

442961

Mfrs. List No.	Order Code	1+	5+	10+	25+	50+
HEDS-9000#B00	116-1233	15.860	15.280	14.730	14.210	13.740
HEDS-9100#C00	116-1236	13.750	13.240	12.770	12.320	11.650
HEDS-9200#300	116-1241	10.400	10.080	9.846	9.622	9.408
HEDS-9200#360	116-1242	10.400	10.081	9.846	9.622	9.408

Over 480,000 products online



Encoders - Incremental - continued

Encoder Module



The module consists of a lensed LED source and a detector IC enclosed in a small C-shaped plastic package.

The two channel module and code wheel gives two outputs in quadrature, and the three channel module and code wheel also gives an index output.

Encoder: H=10.2, W=26.7, D=11.7 (excl. pins), Slot width=1.78
Code Wheel: O/D=50
For shaft dia .4" or 6mm

- High performance low cost optical incremental encoder modules and code wheels
- Module designed to be tolerant to mounting misalignment
- Modules operate from a single 5V supply

Count frequency (guaranteed max.) 100kHz
Code wheel set screw 2.56 (use 0.035" hex wrench)

AVAGO
TECHNOLOGIES

212434

Description	Resolution (PPR)	Mfrs. List No.	Order Code	1+	10+	50+
Encoder Modules						
2 ch.	200	HEDS-9100#E00	165-4863	18.60	17.67	16.74
3 ch.	256	HEDS-9140#F00	165-4867	19.66	18.68	17.69
2 ch.	2000	HEDS-9000#T00	165-4866	18.60	17.67	16.74
2 ch. - Flange Mount	500	HEDS-9730#A50	165-4865	12.58	11.95	11.32
3 ch.	500	HEDS-9140#A00	165-4868	19.66	18.68	17.69
3 ch.	1024	HEDS-9040#J00	165-4869	19.66	18.68	17.69
2 ch.	2000	HEDS-9000#T00	165-4866	18.60	17.67	16.74
Code Wheels						
2 ch., 6mm	200	HEDS-5120#E12	165-4870	11.96	11.36	10.76
3 ch., 6mm	256	HEDS-5140#F12	165-4875	13.46	12.79	12.11
3 ch., .4"	1024	HEDS-6140#J06	165-4878	23.22	22.06	20.90
2 ch., .4"	500	HEDS-5120#A06	165-4872	11.96	11.36	10.76
2 ch., 4mm	500	HEDS-5120#A11	165-4873	11.96	11.36	10.76
3 ch., .4"	500	HEDS-5140#A06	165-4876	13.46	12.79	12.11
3 ch., 4mm	500	HEDS-5140#A11	165-4877	13.46	12.79	12.11
2 ch., 6mm	2000	HEDM-6120#T12	165-4874	22.40	21.28	20.16
Assembly Tools						
		HEDS-8906	165-4879	42.37	--	--

360/500 Pulses/Rev



H=41.1, W=30.0, D=18.3
Mounting: Standard types - 2 screw M2.5 on 19.05 PCD or 3 screw M1.6 on 20.90 PCD
Types with external mounting ears - Overall W=52.1 with 2 fixing holes for M2.5 screws on 46.0 PCD.

AVAGO
TECHNOLOGIES

212435

A series of two and three channel optical encoders incorporating an HEDS9100/9140 series encoder module and an HEDS5120/5140 series code wheel. The outputs of the two channel version are two square waves in quadrature. The three channel version gives one additional index output pulse per revolution.

The standard encoders (without mounting ears) are available for a 4mm or .4" dia shaft and can be mounted to a motor using either the two screw or three screw mounting options on the lid. The encoders with external mounting ears are designed for larger diameter motors and .4" dia shafts. The use of an alignment tool or aligning pins is recommended for 2 channel encoders and is essential for 3 channel encoders. Suitable alignment tools and also connecting leads (length 152mm) are available.

- High reliability
- Quick and easy assembly
- High resolution
- Single 5V supply

Type	Mfrs. List No.	Order Code	1+	10+	50+
Standard - 4mm Shaft Dia.					
3 ch., 500ppr	HEDS-5540#A11	165-4885	39.92	37.92	35.93
2 ch., 200ppr	HEDS-5500#E05	165-4884	37.30	35.44	33.57
Standard - .4" Shaft Dia.					
2 ch., 500ppr	HEDS-5500#A06	165-4880	37.30	35.44	33.57
3 ch., 200ppr	HEDS-5540#E06	165-4881	39.92	37.92	35.93
3 ch., 500ppr	HEDS-5540#A06	165-4882	39.92	37.92	35.93
External Mounting Ears - .4" Shaft Dia.					
2 ch., 500ppr	HEDS-5600#A06	165-4888	37.30	35.44	33.57
2 ch., 360ppr	HEDS-5600#G06	165-4887	37.30	35.44	33.57
3 ch., 500ppr	HEDS-5640#A06	165-4889	39.92	37.92	35.93
2 ch., 200ppr	HEDS-5605#E06	165-4886	37.30	35.44	33.57
Connecting Leads					
2 ch.	HEDS-8902	165-4890	3.92	3.72	3.53
3 ch.	HEDS-8903	165-4891	3.92	3.72	3.53
Alignment Tools					
.4" shaft dia.	HEDS-8910#006	165-4892	5.95	--	--
4mm shaft dia.	HEDS-8910#011	165-4893	5.95	--	--

Panel Mount, 256/360/500 Pulses/Rev



Optical incremental encoders designed primarily for panel mounting. Connections by colour coded flying leads.

- Encoders operate from a single 5Vdc supply
- Two channel TTL quadrature output to provide resolution and direction information

Connections: Ch.A=white, Ch.B=brown, VCC=red, Gnd=black
H=41.1, W=30.0, D=18.3 (body)
Shaft dia.=6.35, L=12.7
Leads L=150

Supply voltage	4.5V - 5.5V	Output voltage	2.4V High level min., V low level 0.4V max.
Supply current	17mA typ, 40mA max.		
Operating temperature	-20°C to +85°C		

212243/406086

Mfrs. List No.	Order Code	1+	10+	50+
256 ppr HEDS-5701#F00	165-4859	39.03	36.30	34.61
360 ppr HEDS-5701#G00	165-4861	39.03	36.30	34.61
500 ppr HEDS-5701#A00	165-4862	39.03	36.30	34.61

Contacting Encoders



- Patented Silver-in-Glass™ switching element technology
- Integral active de-bounce circuitry provides clean, high level outputs with CMOS or TTL logic
- Robust construction, suitable for harsh or dirty conditions
- Available with 2 channel quadrature output or 3 channel with index pulse
- Suitable for high temperatures, vibrations and shock environments

Contact incremental encoders provide a cost effective solution for applications not requiring a high resolution, for example position sensing in many automotive, industrial, agricultural and medical applications.

Resolution 32 pulses / rev.
Rotational speed 200rpm (continuous), 400rpm (periodic)
Rotational life 5000000 shaft rev.
Operating temp. -40°C to +85°C
Supply voltage 3V (min.), 6V (max.)
Dimensions L=7.62 (body), L=22.2 (spindle + bush)
Ø=33.3 (body), Ø=3/8"-32 UNEF-2A (bush), 6.34 (spindle)

Connection	2-Channel Type	3-Channel Type
Input V _s	1	0
Common	2	1
Channel A Out	3	2
Channel Z Out	—	3
Channel B Out	4	4

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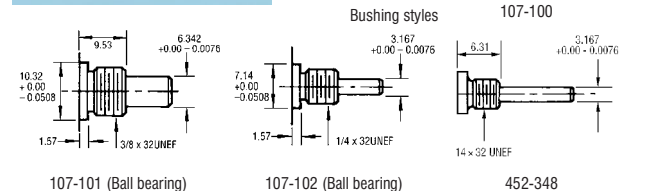
Type	Mfrs. List No.	Order Code	1+	10+	25+	50+	100+
3-Channel	DE2-1-1-32	700-7541	40.63	37.57	33.83	31.28	27.17

EN Series Rotary Optical Encoder



Body
H=21.21,
W=15.88,
D=18.50,
Spindle L=22.23

BOURNS
Reliable Electronic Solutions



- Suitable for digital systems where both magnitude and direction of adjustment must be provided
- 2 bit gray code output produced, channel A leads channel B by 90° (clockwise)
- Ideal as a digital panel control or as position sensing devices in applications where long life, high resolution and precise linearity are critical.

Supply voltage	5V dc ±0.25V dc	Connections	1 Ground
Supply current	26mA max		2 NC
Mechanical rotation	Continuous		3 Output A
Resolution			
(935-8242, 935-8277, 9358250)	128 pulses per revolution		4 +Vcc
(935-8629)	256 pulses per revolution		5 Output B
Operating temperature	-40°C to +85°C		

Mfrs. List No. ENA1J-B28-L00128L = 935-8242, ENC1J-D28-L00128L = 935-8250,
ENS1J-B28-L00256L = 935-8269,

207180

Order Code	Price Each			
	1+	25+	50+	100+
935-8242●	34.50	29.32	26.31	22.48
935-8269●	66.67	51.91	42.09	37.04
935-8250●	41.66	32.45	26.31	23.15

120EN Series Rotary Optical Encoder



Ribbon Cable Horizontal PCB Vertical PCB
Shaft=22 (incl. bush), dia.=6.35
Mounting bush=3/8" x 32 NEF
Ribbon cable length=190

- Manually or motor operated rotary optical encoder
- 2 channel quadrature output, channel A leads channel B by 90° electrically, CCW rotation
- Stainless steel spindle, nickel plated bush
- Ribbon cable, horizontal or vertical PCB mounting versions

Supply voltage	5V dc ±0.25V dc	Maximum rotational speed	300 rpm
Supply current	30mA max.	Rotational life	10 million revolutions
Mechanical rotation	Continuous	Operating temperature	-40°C to +65°C
Resolution	128 pulses per revolution		
Connections		Yellow	Output A
Ribbon cable	Red 5V dc Green Ground	Orange	Output B
		Pin 1	5V dc
		Pin 2	Output A
		Pin 3	Ground
		Pin 4	Output B

207364

Style	Mfrs. List No.	Order Code	1+	10+	50+	100+
Ribbon cable	120EN-128-CBL	114-4747●	41.04	35.25	27.45	23.05
Horizontal PCB	120EN-128-B66	114-4748●	39.44	33.91	26.42	22.17
Vertical PCB	120EN-128-C24	114-4749●	38.96	33.43	26.07	21.84

EC Series Digital Contacting Encoder



Body D=27.6, W=22.2, H=7.4
Shaft=19.0 (incl. bush) x 6.32 dia.
Bush=M9 x 0.75

- Low cost digital contacting encoders, long operating life and high operating temperature characteristics
- 2 bit gray code output is produced, channel A leads channel B by 90° (clockwise)
- Optional snap-on PCB mounting bracket

Contact rating	10mA @ 10V, or 0.1W	Maximum operating speed	120 rpm
Voltage rating	350V ac (or limited by power dissipation whichever <)	Rotational life	200000 revs
		Mechanical rotation	Continuous
		Insulation resistance	>1000Mohm
		Operating temperature	+1°C to +125°C
Dielectric strength	1000V ac		
Cycles Per Revolution	Detents	Mfrs List No.	Order Code
6	24	ECW0J-B24-AC0006	109-111
24	24	ECW1J-B24-AC0024	120-0080

207187/406088

	Order Code	1+	25+	50+	100+
Encoder, 6 cycles	109-111●	3.680	2.880	2.360	2.090
Encoder, 24 cycles	120-0080●	3.680	2.880	2.360	2.090
PCB mounting bracket	219-113	0.300	0.280	0.270	0.196

Low Profile 11mm sq



Bush=M7 x 0.75

- Low profile, high precision audio type encoder
- PCB or chassis mounting with momentary switch

Mfrs. List No. EC11B15242 = 119-1733
EC11B15244 = 119-1734

Voltage rating	5V d.c.	Output signal	Channel A leads Channel B by 60° +/- 30° clockwise rotation
Maximum current	10mA		
Rotational life	15000 cycles		

207244

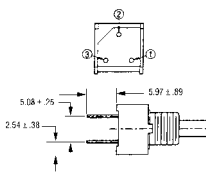
	Order Code	1+	10+	50+	100+	250+
Horizontal	119-1733●	6.21	5.61	5.21	3.93	3.67
Vertical	119-1734●	6.21	5.61	5.21	3.93	3.67

RoHS Compliant
Non-compliant



08447 11 11 11

3315 Series Conductive Plastic



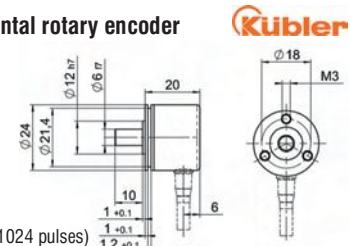
Body H=9.53, W=9.53, D=4.83
Shaft=12.7 (incl. bush) x 3.18
Bush=1/4-32 UNEF-2A

- Miniature package, long operating life for PCB or bush mounting
- On clockwise rotation of the shaft a 2 bit gray code output is produced where channel A leads channel B by 90°.

Contact rating	100mA @ 16Vd.c. or 0.1W	Mechanical rotation	Continuous
Dielectric strength	900V a.c.	Insulation resistance	>1000MΩ
Maximum operating speed	120 rpm	Operating temperature	-40°C to +125°C
Rotational life	100000 cycles	Pulses per revolution	6

224004

	Order Code	1+	25+	50+	100+
Encoder 6 cycles 3315C	935-4018●	1.58	1.47	1.37	1.11
Encoder 6 cycles 3315Y	935-4034●	1.54	1.43	1.33	1.08
Encoder 16 cycles 3315C	935-4026●	1.47	1.36	1.25	1.02
Encoder 16 cycles 3315Y	935-4042●	1.47	1.36	1.25	1.02

2400/2420 - Miniature incremental rotary encoder
24 mm flange

- very small design
- high performance but low cost (up to 1024 pulses)
- chromium-plated housing, IP64 housing
- robust cable entry with multiple clamping, high-flexibility cable
- Rated voltage: 5-24 V push-pull

Mechanical data:

Stainless Steel Shaft 4mm
Connection: 2m high-flexible PVC wire radial
Rotary speed: max. 12 000 min⁻¹
Rotor Moment of Inertia: approx. 0.1 x 10⁻⁶ kgm²
Starting Torque: <0.001 Nm
Load Capacity of Shaft: radial: 10 N / axial: 20 N
Weight: 0.06 kg
Protection to EN 60529: IP 64 Housing
Working temperature: -20°C ... +85°C / Operating temperature: -20°C ... +90°C
Shock resistance to DIN-IEC 68-2-27: 1000 m/s², 6 ms / Vibration resistance to DIN-IEC 68-2-27: 100 m/s², 55 ... 2000 Hz

Electrical data:

Output Circuit
Input voltage: 5 ... 24 V DC
Power Consumption (No Load): max. 50 mA
Permissible Load/Channel: max. 50 mA
Pulse Frequency: max. 160 kHz
Signal Level High: min. UB = -2.5 V
Signal Level Low: max. 0.5 V
Rise Time tr: max. 1 μs / Fall Time tf: max. 1 μs
Short Circuit Proof Outputs: Yes
Conforms to CE requirements acc. to EN 61000-6-1, EN 61000-6-4 and EN 61000-6-3

334405

Type	Imp./U.	Order Code	1+	5+	10+
2400 (Shaft 4mm)					
05.2400.1122.0050	50	472-9481	83.55	75.19	69.78
05.2400.1122.0100	100	472-9493	83.55	75.19	69.78
05.2400.1122.0360	360	472-9500	73.64	69.22	67.75
05.2400.1122.1024	1024	472-9535	77.04	72.42	70.88

100/200 Pulses/Rev - E6A2 Series

Solid 6mm Dia Shaft



- Bi-directional output
 - Supplied with 0.5m connection cable
- Subminiature optical incremental encoders with resolution of either 100 or 200 pulses per revolution.
The encoders are designed for plate mounting.

Encoder: L=31, Dia=25
Shaft: L=8, Dia=4

Radial loading	1kg max	Output	Open collector 6mA max
Axial loading	0.5kg max	Operating voltage	5V dc - 10% to 12V dc +10%
Current consumption	20mA max	Pulse response	20kHz

212436

Type	Mfrs. List No.	Order Code	1+	5+	10+
2 ch., 100 ppr	E6A2CW3C-100	160-3029●	139.89	132.89	125.90
2 ch., 200 ppr	E6A2CW3C-200	160-3030●	139.89	132.89	125.90

Encoders - Incremental - continued

360/1000 Pulses/Rev - E6C Series

Solid 6mm Dia Shaft

OMRON



- Heavy duty industrial use
- 3 channels for bi-directional output with zero index

Optical incremental rotary encoder with resolution of either 360 or 1000 pulses per revolution.

The two outputs allow the direction of shaft rotation to be gauged and the zero index confirms a start reference point. The encoders are designed for plate mounting.

Encoder: L=94, Dia=50,
Shaft: L=15, Dia=6, Cable L=2m

Radial loading 4kg

Operating voltage 4.75V dc - 10% to 27.6V dc +15%

Axial loading 3kg

Pulse response 30kHz

Current consumption 50mA max

Maximum speed 5000rpm

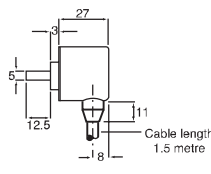
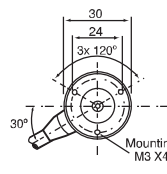
Output 80mA max open collector

212437

	Mfrs. List No.	Order Code	1+	5+	10+
3 ch., 360ppr	E6C2CWZ6C-360	160-3031●	213.35	202.70	192.02
3 ch., 1000ppr	E6C2CWZ6C-1000	160-3032●	249.92	237.43	224.93
Flexible shaft coupling		160-3033●	10.81	10.27	9.73

100 to 1000ppr with Opto-ASIC - RI32-0 Series HENGSTLER

Solid 5mm Dia. Shaft



- Self-test alarm system continuously monitors for disc contamination, disc breakage, over-temperature, under-voltage and excessive LED ageing
- Short circuit and overload protection
- Ingress protected to IP50

High quality 30mm diameter incremental miniature encoders. All have 2 channels and marker pulse outputs.

Supply voltage
Max. pulse frequency
Current consumption
Output voltage

5V dc or 10 to 30V dc

5V=300kHz, 10-30V=200kHz

30mA (24V dc), 40mA (5V dc)

5V input high $\geq 2.5V$, low $\leq 0.5V$ 10 to 30V input high=supply -3V, low $\leq 2V$

NPN open collector 5mA

Alarm output

Maximum output load

Maximum shaft loading

Absolute max. speed

Operating temperature

Storage temperature

Shock resistance

5V supply $\pm 10mA$, 10 to 30V supply $\pm 30mA$

Radial 10N, Axial 5N

4000 rpm

-10°C to 60°C

-25°C to 85°C

100g

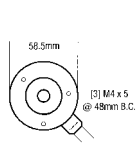
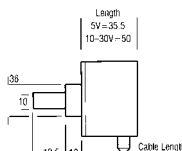
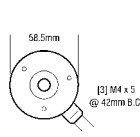
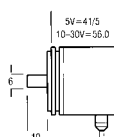
FOR SUITABLE FLEXIBLE COUPLINGS ORDER CODES 730-981 & 730-993

222178

	Mfrs. List No.	Order Code	1+	5+	10+
Push-Pull 5V					
100ppr	RI32-0/100AR.14KB	615-936	104.00	104.00	104.00
360ppr	RI32-0/360AR.14KB	615-948	104.00	104.00	104.00
1000ppr	RI32-0/1000AR.14KB	615-950	105.70	105.70	105.70
Push-Pull 10-30V					
100ppr	RI32-0/100ER.14KB	615-961	104.00	104.00	104.00
360ppr	RI32-0/360ER.14KB	615-973	104.00	104.00	104.00
1000ppr	RI32-0/1000ER.14KB	615-985	105.70	105.70	105.70

1000 to 5000ppr with Opto-ASIC - RI58-0 Series HENGSTLER

Solid 6mm/10mm Dia. Shaft



- Short circuit and overload protection
- Maximum pulse frequency: TTL 300kHz, push pull 200kHz
- IP65 protection
- Set of 3 clamping eccentrics included with synchro flange version

- 2 channels, marker pulse and complimentary line driver outputs
- Self-test alarm continuously monitors for disc contamination, disc breakage, over temperature, under voltage, electrical overload and excessive LED ageing. It provides an open collector NPN output if any of these conditions occur
- Available with 5V TTL or 10 to 30V push pull outputs

A range of high quality 58mm diameter incremental encoders with solid 6mm diameter shafts.

Supply voltage

Current consumption

Output voltage

Alarm output

Max. output load

Max. loadings, 6mm shaft

Absolute max. speed

Operating temperature

Storage temperature

Shock resistance

5V dc TTL or 10 to 30V push pull

TTL - 40mA

push pull 60mA (10V dc), 30mA (24V dc)

TTL high $\geq 2.5V$, low $\leq 0.5V$ push pull high=supply -3V, low $\leq 2V$

NPN open collector 5mA

 $\pm 30mA$

Radial 110N, axial 60N

10000rpm

-10°C to +70°C

-25°C to +85°C

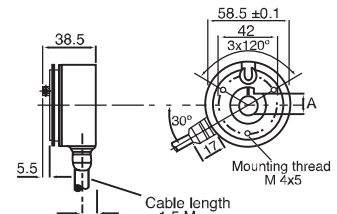
100g

222163

	Mfrs. List No.	Order Code	1+	5+	10+
Solid 6mm Dia. Shaft, Synchro Flange					
2000 5V TTL	RI58-0/2000AS.41RB	615-882	172.40	172.40	172.40
5000 5V TTL	RI58-0/5000AS.41RB	615-894	172.40	172.40	172.40
Solid 10mm Dia. Shaft, Clamping Flange					
1000 5V TTL	RI58-0/1000AK.42RB	723-4480	170.70	170.70	170.70
5000 5V TTL	RI58-0/5000AK.42RB	723-4508	172.40	172.40	172.40
1000 10 - 30V push-pull	RI58-0/1000EK.42IB	723-4510	186.30	186.30	186.30

360 to 5000ppr with Opto-ASIC - RI58-D Series HENGSTLER

Hollow 10 or 12mm Dia. Through Shaft



A range of very slim 58mm diameter incremental encoders with hollow through shaft.

- Short circuit and overload protection
- Maximum pulse frequency 200kHz
- Ingress protected to IP64
- Available to accept 10 or 12mm diameter shafts
- 2 channels and marker pulse 10 to 30V push pull complimentary outputs

Supply voltage

Current consumption

Output voltage

Alarm output

Max. output load

10 to 30V

60mA (10V dc), 30mA (24V dc)

high=supply -3V dc low $\leq 2V$ dc

NPN open collector 5mA

30mA/channel

- Self test alarm system continuously monitors for error conditions and provides an open circuit NPN alarm output if these conditions occur
- Monitored conditions are disc contamination, disc breakage, over temperature, under voltage and excessive LED ageing

Absolute max. speed

Operating temperature

Storage temperature

Shock resistance

Cable length

6000 rpm

-10°C to +70°C

-25°C to +85°C

100g

1.5m

212413

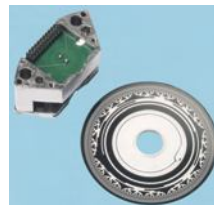
	Mfrs. List No.	Order Code	1+	5+	10+
Hollow Shaft 10mm dia.					
360ppr	RI58-D/360ED.32IB	615-997	215.70	215.70	215.70
1000ppr	RI58-D/1000ED.32IB	616-000	117.85	111.95	108.19
Hollow Shaft 12mm dia.					
1000ppr	RI58-D/1000ED.37IB	616-047	215.70	215.70	215.70
5000ppr	RI58-D/5000ED.37IB	616-060	217.50	217.50	217.50

Encoders - Absolute

Encoder Module

Ultra-precision Plug and Play

AVAGO TECHNOLOGIES



The AEAS-7000 is a high speed, high resolution, absolute encoder module capable of providing up to 16bits of absolute positioning information. It's small, compact and modular form factor also makes it an ideal choice for space-constrained applications while the encoder's Plug and Play feature greatly simplifies the installation process.

The encoder IC consists of 13 signal photo diode channels and 1 monitor photo diode channel and is used for the optical reading of rotary code carriers (i.e., discs). The photo diodes are accompanied with precision amplifiers plus additional

circuitry. The monitor channel is used to drive a constant current source for the highly collimated IR illumination system.

The HEDS-8933 is a Plug and Play tool to align the AEAS-7000 modules and codewheel to the customer's application.

- 13bits or 16bits resolution options
- Serial Synchronous Interface
- Sine/Cosine true differential outputs with 1024 periods

- 16MHz data rate for high-speed applications
- Plug and Play feature

Output

Voltage Supply

Currents Total

16 Bit Gray Code

4.5 to 5.5V dc

25mA

Frequency Clock

Temperature Operating

16 MHz

-25 to 85°C

419552/436285

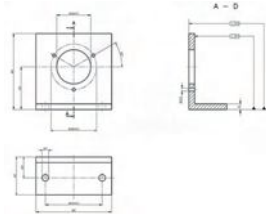
Resolution (Bits)	Mfrs. List No.	Order Code	1+	5+	10+
Encoder Modules					
13 Bit	AEAS-7000-1GSD0	110-2522	46.95	45.21	43.59
16 Bit	AEAS-7000-1GSG0	110-2523	58.68	56.50	54.49
Alignment Tool					
	HEDS-8933	110-2525	136.39	125.52	112.38

Encoders - Accessories

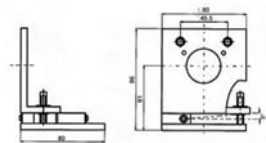
Encoder Mounting Brackets



377-8204



377-8198



234115

Order Code	1+	5+	10+	25+	50+
377-8204	24.80	24.06	23.56	23.06	22.29
377-8198	63.95	62.03	60.75	59.48	57.57

Measuring Wheel - 0.5m Circumference
10mm Diameter Shaft

- Aluminium measuring wheel has 10mm bore diameter, suitable for use with Hengstler RI58 (10mm dia. shaft) encoders or similar
- Suitable for measuring length of paper, cardboard, non-greasy metals, soft and hard plastics, undressed or surface treated wood
- Tread is 22mm wide white low-wear rubber with good grip

W=25, Circumference = 500

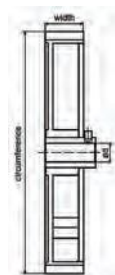
212378

Mfrs. List No.	Order Code	1+	5+	10+
0.601.151	723-4478	45.01	43.40	41.76

Measuring Wheels



- High quality
- Suitable for measuring a variety of materials



234118

Circumference (mm)	Width (mm)	Bore Dia (mm)	Coating	Mfrs. List No.	Order Code	1+	5+	10+	25+	50+
200	12	10	Pimped rubber	9109-10	377-8253	39.56	38.36	37.59	36.79	35.55
500	25	10	Pimped rubber	9102-10	377-8228	62.15	60.42	58.79	57.24	55.77

Flexible Couplings



Flexible couplings suitable for Hengstler and similar encoders to protect them against excessive mechanical stresses.



Type	Plastic	Helical
Absolute max. speed	10000rpm	6000rpm
Torque max.	0.2N-m	0.8N-m
Max. angular misalignment	±2.5 degrees	±4 degrees
Max. shaft misalignment radial/axial	±0.3mm/±0.2mm	±0.25mm/±0.4mm
Material	Polyamide 6.6 glass-fibre reinforced RI32 Series (5mm shaft)	AlCuMgPb, chromed RI58-0 Series (6mm shaft)

212244

Type	Hub Diameters	Mfrs. List No.	Order Code	1+	5+	10+
Plastic	5/5mm	3.520.034	730-981	15.08	14.34	13.85
Plastic	5/6mm	3.520.003	730-993	15.05	14.31	13.83
Helical	5/6mm	3.520.035	731-006	25.13	23.87	23.05
Helical	6/6mm	0.070.653	731-018	25.13	23.87	23.05

Flexible Couplings



Helical 6x6 L=35, Dia=16

Helical 10x10 L=50, Dia=26



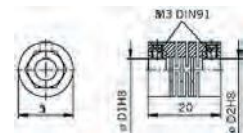
Precision L=25, Dia=25

	Helical 6x6	Helical 10x10	Precision
Maximum rpm	3000	3000	12000
Nominal torque	0.5Nm	1.5Nm	0.4Nm
Max radial mismatch	1mm	1.5mm	±0.4mm
Max. angle error	5.0°	5.0°	±2.5°
Max. axial mismatch	±1mm	±1mm	±0.4mm
Binding posts	M4	M5	M4
Max. starting torque	120Ncm	120Ncm	80Ncm
Maximum rpm	Nickel-faced spring steel, zinc diecast	Nickel-faced spring steel, zinc diecast	Flange: zinc diecast, Housing: polyamide 6.6
Weight	28g	120g	23g

234119

Type	Order Code	1+	5+	10+	25+	50+
Helical	6x6 377-8277	14.62	14.18	13.89	13.60	13.15
	10x10 377-8265	17.72	17.20	16.84	16.48	15.94
Precision	6x10 377-8290	39.37	38.20	37.41	36.62	35.39
	10x10 377-8307	42.83	41.55	40.69	39.82	38.53

Insert coupling



RPM value	12000rpm	Axial offset	±0.2 mm
Torque	0.2mN-m	Material	Plastic
Radial offset	±0.3 mm	Body	Plastic
Angular error	±2.5 degree	Hexagon Socket	Plastic

248963

	Mfrs. List No.	Order Code	1+	3+	5+
Voltage Coupling Ø1 = 6, Ø2 = 6	Z 121.D01	349-0701	11.53	11.17	10.71

Over 480,000 products online



Displacement Sensors

Rotary Position Sensor - Hall Effect
Stainless Steel Shaft

Honeywell



The HRS100 provides angular position information for a variety of sensing and control/positioning applications in the automotive, marine, off-road, industrial implementation, aerospace and rail industries. The use of magnetically coupled information in place of a mechanical wiper assembly provides longer life, a more cost-effective solution for harsh environments that include temperature, vibration, moisture and dirt.

- Solid-state Hall-effect technology
- Maximum ESD sensitivity of ± 7 kV
- Slotted shaft

Typical applications include:

- Foot pedal and Steering position
- Seat, Mirror & Tilt position
- Throttle/speed position and control

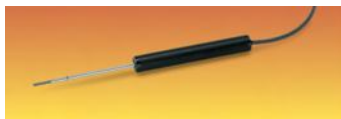
Mechanical angle of rotation $90^\circ \pm 2^\circ$
Output current 2mA max
Overvoltage Protection 18 Vdc max.
Package Style Stainless steel shaft and Brass bushing
Supply Voltage 5Vdc $\pm 10\%$
Temperature range -40°C to $+85^\circ\text{C}$

383312/406090

Mfrs. List No.	Order Code	1+	10+	25+
HRS100SSAB090	868-8338▲	40.04	32.08	26.74

Miniature Industrial Transducers

Honeywell



- Linearity of better than 0.1%
- Dual wiper design on Myst R® plastic element
- Extruded wiper block guides
- Internal spring-loaded ball joint

- Anodised extruded aluminium housing
- Stainless steel shaft
- Fits into tight spaces, clamps easily to cylinders

Small diameter linear position sensor, rugged enough to withstand a hostile environment and easy to interface without additional amplifiers.

Independent linearity $> \pm 0.1\%$
Resistance per 25mm LT Series = 1000 Ω , MLT Series = 1500 Ω (electrical travel)
Resistance tolerance $\pm 20\%$
Operating temp. range -40°C to $+80^\circ\text{C}$
Starting force 29g
Resolution Infinite
Shaft thread 4 - 40 UNC
Dimensions, MLT Series Housing: L = electrical travel + 30.48, $\varnothing = 9.53$ Shaft: L = 19.05 (retracted)

Measuring Range	Electrical Travel (mm)	Mfrs. List No.	Order Code
MLT Series			
25mm	25.4	06MTL0025A	708-8530
LT Series			
150mm	152.4	06LT0150A	708-8589

224731

Measuring Range	Mfrs. List No.	Order Code	1+	10+	25+
25mm	06MTL0025A	708-8530	124.61	117.60	111.42
150mm	06LT0150A	708-8589	223.97	210.39	196.36

Heavy-Duty Industrial Transducers

Honeywell



Rugged linear sensor used on a wide variety of manufacturing and process equipment.

The mechanical design of the unit has front and rear bearings, anodised extruded aluminium housing and stainless steel shaft.

- Over 2mm thick housing with 6mm stainless steel shaft seals
- Myst R® plastic elements tested to 1000 million operations
- High performance measurements
- Absolute continuous measurements
- Rugged construction for factory environment

Independent linearity $\pm 0.1\%$
Operating temperature range -65°C to 105°C
Total resistance (electrical travel) Short Longfellow Series = 1500 Ω /25mm
Resistance tolerance $\pm 20\%$
Watts per 25mm Longfellow II Series = 5000W total (all lengths)
Shaft starting force 0.75
Resolution 0.45kg
Shaft thread Infinite
Shaft thread M6
Dimensions Housing: L = see below, W = 22.8, H = 22.8
Fixing centres (bracket): 34.4 x 2 x 3.9
Shaft: L = 34.5 (retracted), M6 1 thread

Applications: Injection moulding machines, printing presses, meat packing equipment, drill presses, cranes, scales, front-end loaders, wood-working machines.

Measuring Range	Housing Length	Elektrischer Meßweg (mm)	Mfrs. List No.	Order Code
Short Longfellow® Series				
25mm	103	25.4	06LF0025A	708-9028
50mm	128	50.8	06LF0050A	708-9030
100mm	177	101.6	06LF0100A	708-9041
150mm	227	152.4	06LF0150A	708-9053
Longfellow® II Series				
225mm	319	229	06LF0225A	708-9065
300mm	395	305	06LF0300A	708-9077
450mm	548	457	06LF0450A	708-9089

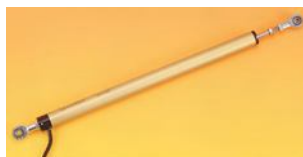
224732

For suitable connector see Order Code 112-2592

Measuring Range	Mfrs. List No.	Order Code	1+	10+	25+
25mm	06LF0025A	708-9028	218.69	191.23	187.40
50mm	06LF0050A	708-9030	218.69	191.23	187.40
100mm	06LF0100A	708-9041	211.23	184.71	181.01
150mm	06LF0150A	708-9053	162.10	—	—
225mm	06LF0225A	708-9065	275.42	253.07	232.35
300mm	06LF0300A	708-9077	283.90	247.63	228.30
450mm	06LF0450A	708-9089	354.45	302.08	288.02

Miniature Precision Linear Transducers

34L Series



- Rugged and accurate ideally suited for industrial applications
- High accuracy $\pm 0.1\%$
- Essentially infinite resolution
- Long life
- Double ball joint shaft terminations

Independent linearity $> \pm 0.1\%$
Operating temperature range -55°C to 125°C
Total resistance 10K Ω
Resistance tolerance $\pm 20\%$
Maximum Power Rating 0.05W/cm@70 $^\circ\text{C}$
Dimensions 366-6724 Housing: L = 182.8 Ball joint fixing centres = 251.6
366-6736 Housing: L = 304.8 Ball joint fixing centres = 373.6

233671

Measuring Range	Mfrs. List No.	Order Code	1+	10+	25+
100mm	34L 4D 103 W03263	366-6724	163.83	144.34	129.71
200mm	34L 8D 103 W03263	366-6736	209.62	184.67	165.93

Precision Linear Transducers

115L Series



- Rugged compact and accurate, for use in many industrial applications
- High accuracy $\pm 0.05\%$
- Essentially infinite resolution
- Long life
- Not sensitive to temperature variations
- Moveable mounting brackets
- Ball joint can be ordered separately for greater flexibility

Independent linearity $\pm 0.1\%$
Operating temperature range -55°C to 125°C Maximum Power Rating 0.05W/cm@70 $^\circ\text{C}$
Total resistance 5K Ω Dimensions Housing: L = measuring range + 75
Shaft: L = 25 (retracted)

233680

Measuring Range	Mfrs. List No.	Order Code	1+	10+	25+
130mm	115L 5,2E 502 W06017	366-6750	77.51	68.29	61.37
225mm	115L 9E 502 W06017	366-6761	90.66	79.86	71.77
350mm	115L 14E 502 W06017	366-6773	109.35	96.32	86.56
750mm	115L 30E 502 W06017	366-6803	174.27	153.54	137.97
Ball Joint (pair)	320 371	366-6815	7.11	6.26	5.63

Tilt Sensors

OMRON

Tilt Sensor



H = 23, W = 36.5,
Dia. = 22mm

This compact tilt sensor is intended for use in systems such as portable heaters and HVAC equipment. The sensor acts as a safety cut-out to prevent operation when knocked out of a fully vertical position. The D7E-3 has an operating angle of 50° to 80° , minimising the risk of false triggering by small vibrations and knocks. It is self-resetting with a return angle of 25° . This allows the system to be repositioned and restarted without further intervention. The sensor features 10mm pitch, 5mm quick connect terminals for ease of installation.

Contact Form	Single Pole Single Throw NC	Operating Humidity	25 to 85% RH
Rating	5V dc, 0.1mA to 30V dc, 100mA	Operating Temperature	-25°C to 60°C
Contact Resistance	300mR	Insulation Resistance	100 MR Min.

418089

Mfrs. List No.	Order Code	1+	5+	Price Each	10+	+	+
D7E-3	100-7618	3.09	2.91	2.84	--	--	--

Subminiature Tilt Sensor

PCB Mounting - Discriminating Left or Right



- Subminiature SMD PCB mounting
- Detects the inclination of the sensor between 40° and 80° (Left and Right)
- Reset angle range between 50° and 10°
- Utilizes a highly reliable solid state Hall effect IC
- Low power consumption

OMRON

New

H = 7, W = 7, D = 2mm

This Hall effect tilt sensor is ideally suited for vertical or horizontal discrimination of digital cameras, PDA's, cellular phones, picture viewers and general orientation detection.

Angle - Activate	40 to 80° (Left and right)
Angle - Reset	50 to 10°
Supply Voltage	2.4 to 3.6V dc
Current Consumption	10µA
Operating Temperature	-10°C to 60°C

508847

Mfrs. List No.	Order Code	1+	25+	Price Each	100+	250+
D6BN-1	SMC157-3143	2.86	2.46	2.03	1.71	1.61

Non-Mercury

ASSEMBLY



540-614
L=10.2, Dia.=4.7,
Leads L=12, Dia.=0.51,
Lead spacing=2.9



730-221
H=25.0, W=27.0, D=7.0,
Fixing centres=10.0 (Dia 3.3)
Cable L=300



732-825
L=30, W=20, D=7,
Cable L=300
Fixing slots=6x3.3,
Fixing centres=16.0

- Hermetically sealed tilt switches using non-toxic materials
- 540-614 is designed to meet a wide range of low level switching applications
- 730-221 will switch up to 10VA
- 732-825 has fixing slots for fine adjustment in alignment
- Suitable for safety and security systems, limit, position and level sensing

	540-614	730-221	732-825
Switching voltage	60V ac	240V ac	60V ac
Switching current	0.25A	0.5A	0.25A
Switching power	3VA	10VA	3VA
Contact resistance, (max)	30kΩ	150kΩ	30kΩ
Max. differential angle	15°	90°	16°
Max. 'break' angle above horizontal	10°	45°	10°
Max. 'make' angle below horizontal	10°	45°	10°
Operating temperature	-40°C to +150°C	-20°C to +70°C	-20°C to +70°C

212169

Mfrs. List No.	Order Code	1+	25+	Price Each	100+	250+	1K+
CW1300-1	540-614	1.15	0.99	0.82	0.77	0.68	
MTA240	730-221	6.26	5.43	4.61	3.81	--	
TSW30/60	732-825	6.18	5.41	4.65	4.28	--	

Tilt/Movement

ASSEMBLY



L=10.2, Dia.=4.7, Leads L=16.8,
Dia=0.46, Lead spacing=1.27

- Miniature mercury switch encapsulated in a nickel plated steel case for PCB mounting
- Senses tilt from horizontal, movement, impact etc.
- Mercury wetted contacts give low contact resistance throughout the life of the switch

Switching current	200mA @ 240V ac	Operating modes	Max. 'break' 15° above horizontal
Switching voltage	240V ac, 168V dc		Max. 'make' 5° below horizontal
Switching power	10hm	Operating temperature	-37°C to +100°C

WARNING: THIS SWITCH SHOULD NOT BE OPENED AS IT CONTAINS MERCURY, A TOXIC SUBSTANCE

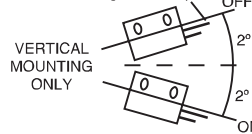
212441

Mfrs. List No.	Order Code	1+	25+	Price Each	100+	250+	1K+
CM13R-0	178-338	2.07	1.78	1.48	1.25	1.12	

Surface Mounting



607-265: L=30, W=20, D=7, Pin L=20,
Fixing slots=6x3.3. Fixing centres 16
Long lead to top



- Encapsulated mercury switches for surface mounting applications
- Fixing slots allow for fine adjustment in alignment

176-794 is fitted with 300mm 2-core PVC insulated cable.

607-265 has two 20mm wire leads and has transparent housing giving visual indication of switch position.

Switch Current	Switch Voltage	Switch Power	Contact Resistance	Order Code
1A max.	240V rms max.	100W max.	0.3kΩ	176-794
0.25A max.	240V rms max.	10W max.	0.25kΩ	607-265

WARNING: THESE SWITCHES SHOULD NOT BE OPENED AS THEY CONTAIN MERCURY, A TOXIC SUBSTANCE

212215

Mfrs. List No.	Order Code	1+	25+	Price Each	100+	250+
S1039	176-794	6.77	5.92	5.01	4.29	
TSM4/240	607-265	6.89	6.06	5.11	4.37	

Insulated Steel

ASSEMBLY



170-853
L=46, Dia=13.5, Lead length=150

170-854
L=60.3, Dia=21.4, Lead length=150

- Steel cased tilt switches insulated overall with PVC giving compact size and high structural strength
- Designed for horizontal mounting
- Fast switch action with no bounce
- High current switching capability for direct motor control
- Use for tilt sensing, level control, inertia or rotation sensing and in security applications

The mercury-to-mercury contacts close when the switch is tilted below horizontal. The switches have silicone rubber leads and are supplied with mounting clips.

Min Tilt from Horiz.	Rating	Order Code
16°	240V ac	170-853
13°	13AA	170-854
	19A	

WARNING: THESE SWITCHES SHOULD NOT BE OPENED AS THEY CONTAIN MERCURY, A TOXIC SUBSTANCE

212442

Contact Rating	Mfrs. List No.	Order Code	1+	Price Each	25+	100+
13A	S1016	170-853	10.14	9.53	9.34	
19A	S1017	170-854	11.21	10.55	10.32	



607-241
Body dia.=28, H=29
Fixing centres 42, Dia.=4.2



*not available for sale

ASSEMBLY

170-888
Flange dia.=24, Body dia.=19.5
H=9.2, (22.1 overall)
W(overall incl. terminals)=31.8

Hermetically sealed mercury tip-over switches designed for a variety of level sensitive equipment. Switch contacts are closed when vertical as shown and open when tilted in any direction.

607-241: Switch in polypropylene housing, contacts are closed and open when tilted in any direction 35° from vertical. Fixing holes allow easy fitting. Fitted with silicon rubber coated tin/copper leads.

170-888: Nickel plated steel bodied switch has contacts which open at 25° to 45° from vertical. Connection by 6.35mm spade terminals.

Contact Rating	Contact Resistance	Order Code
15A @ V ac/50V dc, 15A @ 240V ac	1kΩ typ.	170-888
	0.3kΩ max.	607-241

WARNING: THESE SWITCHES SHOULD NOT BE OPENED AS THEY CONTAIN MERCURY, A TOXIC SUBSTANCE



Tilt Sensors - continued

212217

Mfrs. List No.	Order Code	1+	25+	100+	250+
CM15-T5	170-888	5.85	5.13	4.32	3.73
S1116	607-241	6.63	6.11	5.99	5.38

Tip-Over Switch, Non-Mercury



- Hermetically sealed switch
- Switch contacts are closed when vertical as shown and open when tilted in any direction
- Non-mercury contacts

L=7.6, Body dia.=5.7mm,
Leads: L=8.6, Dia.=0.5

Switching voltage	60V ac	Contact resistance	5mΩ
Switching current	0.25A	Operating temperature	-37°C to +100°C
Switching capacity	3VA	Case material	Steel Tin Plated (case)
Operating angle	60°±10°		

212408

Mfrs. List No.	Order Code	1+	50+	100+	250+
CW1260	309-4790	5.29	4.01	3.20	2.95

Tip-Over/Jitter Switch



Miniature mercury switch with tin plated steel body. Contacts are closed in vertical position, opening when tipped over. Switch may also be used to sense movement or vibration.

Contacts 'must open' angle	60° from vertical
Contacts 'must close' angle	30° from vertical
Contacts rating	0.5A, 120V ac
Contacts resistance	3Ω

Flange dia.=9.5, Body dia.=8.2,
H=9.5, Pin L=11.8, Pin spacing=2.0

WARNING: THIS SWITCH SHOULD NOT BE OPENED AS IT CONTAINS MERCURY A TOXIC SUBSTANCE

212152

Mfrs. List No.	Order Code	1+	25+	100+	250+
CM1421-0	723-745	2.91	2.68	2.63	2.54

Motion Sensors

Movement - Miniature



L = 5, Dia = 5.5

This miniature sensor has been specifically designed for the detection of movement and vibration. The sensor is non position sensitive offering a similar level of sensitivity whatever its position and has been designed for use with analogue or digital circuitry.

The sensor reacts when disturbed by giving a fleeting change of state (ie NO to NC). The time taken to settle depends on the amount of energy absorbed by the device, the settled state will be random unless mounting attitude is chosen for a NC output.

- Hermetically sealed non toxic metal cased switch with gold contacts
- Designed to meet a wide range of low level switching applications
- Suitable for security, limit, keyfob activation, position and level sensing
- Can also be used as a tilt switch
- Miniature size
- Non-Mercury content

Switching Voltage	24 Vac	Contact resistance	≥10 Ω
Current Rating	0.02 A	Operating temperature	-37°C to 100°C
Switching Power	5 VA	Case Material	Steel -Gold Plated

249450

Mfrs. List No.	Order Code	1+	5+	10+
MS24M	422-9046	4.30	4.14	3.73

Shock / Linear Acceleration Switches



L = 6.8, Dia = 4.6

- Robust construction with sealed gold plated contacts
- Easy fitting and proven reliability
- Particularly suited for use in monitoring of centrifugal forces and controlling spin speeds

- Industrial and Medical centrifuge applications
- Electrical generating windmill applications
- Shock sensing in automotive and security applications etc

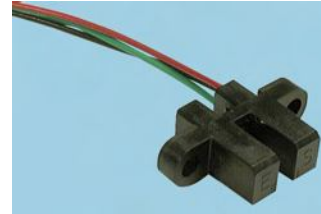
Contact	1 N/O	Operating temperature	-25°C to 85°C
Switching Voltage	24 Vac	Activation level	499-90582 to 4.9 g
Current Rating	0.25A		499-906010 to 14.9 g
Switching Power	5 VA		499-907115 to 19.9 g
Contact resistance	10Ω		

249447

Activation Level	Mfrs. List No.	Order Code	1+	5+	10+
2 to 4.9 g	ASLS2	422-9058	3.29	3.22	2.91
10 to 14.9 g	ASLS10	422-9060	2.95	2.89	2.60
15 to 19.9 g	ASLS15	422-9071	1.96	1.92	1.73

SR16C-J6 Digital Vane Sensor

Honeywell



- Compact, robust package
- Mechanically interchangeable with standard optical style sensors
- Operated by a 'Ferrous Vane' interrupter for pulse counting or position sensing
- Current sinking (open collector) output
- 3.8V dc to 30V dc power supply
- Medium level magnetic switching to reduce stray field interference
- Internally sealed packages for moderate environment applications

- No mechanical contacts; eliminates product wear
- Non-contact position sensing

Package Style	Dual Tower Wire Exit
Supply Voltage	3.8 to 30V dc
Output Type	Sink
Termination Type	26 Gauge 7 Strand Lead Wire
Operating Temperature	-20 to 85°C
Output Voltage	0.4V dc
Vibration	10g/10Hz to 500Hz
Humidity	95% RH/40°C 100 h
Vane and Geartooth	Low Carbon Steel, High Permeability,
Target Material	Low Residual Induction
Output Current (Max.)	40mA
Supply Current (Max. @ 25°C)	10mA
Vane Thickness	1.14mm
Minimum Tooth Depth	6.35mm

419622

Mfrs. List No.	Order Code	1+	5+	10+	25+	+
SR16C-J6	108-2266	4.51	4.15	3.59	2.97	--

Vibration/Motion Switches



540-626
L=9.5, Dia.=8.2, Leads L=11.2,
Dia.=1, Lead spacing=5



607-253
L=7.1, Dia.=4.6, Leads
L=7.5,
Dia.1, Lead spacing=6.3

Hermetically sealed switches which make contact when subject to vibration or motion.

540-626: A non-position sensitive switch whose contacts are open when at rest.

607-253: This switch is position sensitive and will be either open or closed depending on the centre electrode. Sensitivity can be varied by the position of the switch.

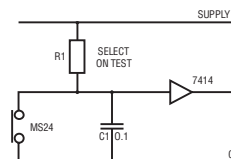
Contact Rating	Temperature Range	Order
0.75A @ 240V ac, 1A @ 110V ac	-40°C to +260°C	540-626
0.1A @ V ac	-40°C to +260°C	607-253

WARNING: THESE SWITCHES SHOULD NOT BE OPENED AS THEY CONTAIN MERCURY, A TOXIC SUBSTANCE

21214

Mfrs. List No.	Order Code	1+	25+	Price Each	250+	1K+
CM4400-1.	540-626	2.55	2.36	2.31	2.22	2.04
CM1800-1.	607-253	2.34	2.17	1.83	1.56	1.39

Vibration/Movement Switch - High Sensitivity Non-mercury



H=9.5, Dia=8.2, Leads L=4.5, Dia=1 Lead spacing=4.7

- Very high sensitivity detection of movement or vibration
- Non-position sensitive, offers a similar level of sensitivity whatever its position
- Long life and high reliability in a wide range of environments
- Ideal for anti-tamper and interference detection

A patented design non-mercury switch in hermetically sealed body with gold contacts. The contacts in their normal mode can be closed or open. When subjected to any small movement or vibration, the contacts will vibrate on and off repeatedly. The output may be damped if less sensitivity is required.

Applications: Movement detection - starting or running of motors, process equipment, detecting unusual levels of movement or vibration, detecting intrusion into control panels and security systems, anti-theft mobile systems in cars, laptop computers.

Switching voltage	24V ac	Contact resistance, initial	2 Ω
Switching current	24mA	Operating temperature	-37°C to +100°C
Contact style	change of state	Case material	Steel, Gold Plated

212357

Mfrs. List No.	Order Code	1+	25+	100+	250+	1K+
MS24	732-795	3.06	2.52	2.03	1.86	1.75

Adjustable Sensitivity Module



H=20.3, W=38 (body), 60 (overall), D=32,
Fixing centres=50.8 (Dia.=4.7),
Cable L=300

Connections: Brown=5V,
Green=0V, White=Output

- Module incorporates Assemtech MS24 high sensitivity non-mercury vibration/motion switch
- Desensitising circuit allows response of sensor to be reduced
- Sensitivity is adjustable by trimmer ensuring no output below set level
- Omni-directional motion sensing
- Output is referenced to 0V and can drive a transistor or similar device
- Unit is fully encapsulated

Supply voltage 5V dc Output current 24mA @ 5V dc
Supply current 40mA max. Operating temperature -10°C to +70°C

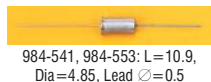
212355

Mfrs. List No.	Order Code	1+	10+	25+	100+
MS24A/30.	723-0424	18.12	16.17	13.92	12.40

Shock/Linear Acceleration Switch



730-210: L=6.8, Dia.=4.6
Leads L=11, Dia.=0.5



984-541, 984-553: L=10.9,
Dia=4.85, Lead \varnothing =0.5

The switches are fitted with a spring loaded contact which closes when the switch detects shock or acceleration above its activation level. The contact will open again when acceleration decreases.

- Robust construction with sealed contacts
- Easy fitting and proven reliability
- Particularly suited for use in monitoring of centrifugal forces and controlling spin speeds
- Industrial and medical centrifuge applications
- Electrical generating windmill applications
- Power switching in automotive applications, etc.

Switching voltage	24V ac	Contact resistance	10 Ω max.
Switching current	0.25A max.	Operating temperature	-20°C to +85°C

212282

Activation Level	Mfrs. List No.	Order Code	1+	25+	100+	250+
5.0 \pm 1.5 g	ASLS5	730-210	5.68	5.26	4.43	3.71
5.5 \pm 1.5 g	ASS/5.5	984-553	23.68	21.16	17.85	14.87

Shock Sensor, Plastic Case



H=4.5, W=34.4, Dia.=24.0
Fixing centres=29.0,
Hole dia=2.2, Lead L=40mm

Sensitivity 40mV/G (typ) @ 25°C
Capacitance 10,000 pF \pm 30% @ 25°C, 1kHz

- Senses mechanical shock, vibration or acceleration
- Output proportional to amount of G subjected to it, typically 40mV/G
- Applications: bank equipment protection, burglar alarms for vehicles, vending machines, shop windows, etc.

Piezoelectric ceramic sensor housed in a plastic case with flying lead connections.

Insulation resistance 30M Ω (min) @ 100V dc
Operating temperature -20°C to +60°C

212455

Mfrs. List No.	Order Code	1+	25+	100+	250+
PKS1-4A10	160-5333	3.47	2.74	2.16	2.01

PIR-Motion Sensor

AMN



- Very small dimensions: \varnothing 10 x 13.5mm (Standard Type)
- Built-in amplifier for direct connection to μ -controller
- Two colours: black and white
- 4 detection types: standard, slight motion, spot, 10m
- Ambient temperature: -20°C to +60°C

Power Supply Voltage Vdd 3 - 6V dc
Output Voltage Vdd - 0.5V
Output Current 100 μ A
Circuit Stability Time 7s (Typ.)
Detection Performance

Standard - 5m, 100° horizontal, 82° vertical
Slight Motion - 2m, 91° horizontal, 91° vertical
Spot - 5m, 38° horizontal, 22° vertical
10m Type - 10m, 110° horizontal, 93° vertical

475764

Detection	Mfrs. List No.	Order Code	1+	5+	10+
White Lens					
Standard	AMN31112J	137-3711	11.23	10.67	10.33
Slight Motion	AMN32112J	137-3713	11.23	10.67	10.33
Spot	AMN33112J	137-3715	11.23	10.67	10.33
10m Type	AMN34112J	137-3718	11.95	11.35	10.99
Black Lens					
Standard	AMN31111J	137-3710	11.23	10.67	10.33
Slight Motion	AMN32111J	137-3712	11.23	10.67	10.33
Spot	AMN33111J	137-3714	11.23	10.67	10.33
10m Type	AMN34111J	137-3716	11.95	11.35	10.99

Pyro Detector Modules

Seiko



MS-331



MS-311



MS-401

A Selected range of small Passive Infrared (PIR) modules that combine a pyroelectric infrared detector, sensor circuitry and a lens.

The MS-3xx series have a range of 5 metres, each module has its own timer and output time can be freely adjusted. They have a choice of two operating modes: one-shot and retriggerable. The output is via an open collector transistor.

The MS-400 sensor is a miniature PIR module without timer, it is designed for mounting directly onto a PCB. This module has a height of only 15.9mm but has a range of 2.5 metres. Applications include:

- Automatic Light Switches
- Safety Systems
- Intruder Alarms

Max range	Lens Diameter / width	Depth	Supply voltage (min)	Supply voltage (max)	Detection spread angle	Mfrs. List No.	Order Code
5m	23 \varnothing	24	2.6	5.5	40°	MS331	120-9947
2.5m	14.3 \varnothing	15.9	4.5	5.5	54°	MS401	120-9948

241022

Mfrs. List No.	Order Code	1+	5+	10+
MS331	120-9947	17.26	15.81	14.62
MS401	120-9948	9.79	8.98	8.29

Pyroelectric Infra-Red Detector

muRata



- Movement sensor, for example in infra-red intruder alarms
- Sensor incorporates an optical filter to reflect white or visible light
- Improved sensitivity and reduced white noise
- Suitable Fresnel lens arrays also available

Dual element infra-red detectors housed in metal can package.

731-950: H=4.7, Dia=9.1

Detector

Sensitivity @ 500°K, 1Hz
Sensitivity balance
White noise level
Source voltage

4.3mVpp(typ.)
10% max
200mVpp max
0.2-2.5V

Supply voltage
Viewing angle
Element size
Operating temperature

2-15V dc
45°x45°
(2.0x1.0mm)x2
-40°C to +70°C

Mfrs. List No. IRA-E700St0=100-6209

212444

Detector	Order Code	1+	10+	25+	100+
	100-6209	2.17	1.79	1.54	1.43

Over 480,000 products online



Motion Sensors - continued

Pyroelectric Infrared Sensor

muRata



Module



Fresnel Lens

This pyroelectric infrared sensor exhibits high sensitivity and reliable performance made possible by ceramic technology and the hybrid IC techniques employed during fabrication. The Fresnel lens is used to decide the detection distance and the detection area (angle) of the sensor.

- High sensitivity and excellent Signal to Noise ratio
- High stability, immunity to temperature changes
- Slight movement is detectable
- High immunity to external noise (Vibration, RFI etc.)

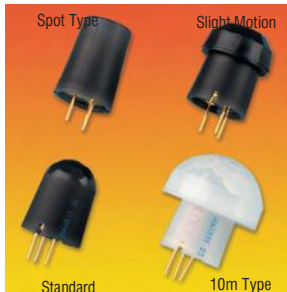
Supply Voltage	Total Resistance	White Noise	Detection Width (mm)	Operating Temperature	Description	Order Code
2 to 15V	47k to 200kΩ	200mVp-p Max.	4.7±0.1	-40 to 70°C	PIR	100-6207
-	-	-	6.6	-25 to 60°C	Fresnel Lens	100-6208

338804

Mfrs. List No.	Description	Order Code	1+	5+	10+
IRA-E712ST3	Module	100-6207●	2.32	1.94	1.66
IML-0636	Fresnel Lens	100-6208●	1.61	1.34	1.15

Motion Sensor, PIR - MP Series

NAIS



- Extremely compact
- Built in amplifier, can be connected directly to a microprocessor
- Dual lens colours available to match equipment
- 4 detection types: Standard, Slight Motion, Spot Type, 10m Type

Voltage	3V dc to 6V dc	Standard	5m 100° Horizontal, 82° Vertical
Output	Vdd -0.5V, 100µA	Slight	2m 91° Horizontal, 91° Vertical
Circuit stability time	7s (typ)	Spot	5m 38° Horizontal, 22° Vertical
Detection Performance		10m	10m 110° Horizontal, 93° Vertical

249101

Lens Colour	Mfrs. List No.	Order Code	1+	5+	10+
Standard					
Black	AMN11111	416-0253●	12.99	12.59	11.33
White	AMN11112	416-0265●	13.82	13.03	11.48
Slight Motion					
Black	AMN12111	416-0277●	14.32	13.88	12.48
Spot Type					
Black	AMN13111	416-0290●	13.51	13.09	11.78
White	AMN13112	416-0307●	13.51	13.09	11.78
10m Type					
Black	AMN14111	416-0319●	14.19	13.74	12.37
White	AMN14112	416-0320●	14.19	13.74	12.37

Stopped Motion Monitor - ROTASTOP3

SYNATEL INSTRUMENTATION LTD

Self-contained



- Self-contained, no moving parts
- Universal voltage, two wire operation
- Simple, low-cost installation
- No contact with moving parts

L=95, Dia.=M18 (overall)

The ROTASTOP SU1MZ is ideal for monitoring chain- or gear-driven machinery such as gearbox drives, screw conveyors etc. but is suitable for almost any application where stoppage detection is needed.

Supply	24 to 240V ac/dc	Target	18mm dia. target for Maximum range
Ambient temperature	-15°C to +60°C	Time delay	4 sec.
Operating speed	15 to 3600 ppm	Start up delay	4 sec.
Protection	IP65	Cable	2 core, PVC sheathed, 2m length
Output	Normally closed	Indication	LED indication of input pulsed and output energised
Output rating	1.6mA min, 200mA max. (volt drop 8V)	Enclosure	Moulded polycarbonate
Operating distance	8mm ferrous metal		

212318

Mfrs. List No.	Order Code	1+	5+	10+
SU1MZ(A)	705-9220	104.32	99.10	92.74

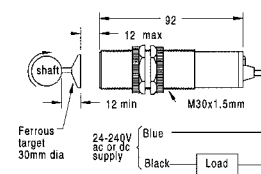
Underspeed Monitor - ROTASLIP

SYNATEL INSTRUMENTATION LTD

Self-contained



L=92, Dia.=M30



Note: The load must have the same voltage rating as supply being used.

Supply	24 to 240V ac/dc
Ambient temperature	-15°C to +50°C
Operating speed	10 to 3600 ppm
Protection	IP65
Output	Normally closed at set speed
Output rating	1.6mA min, 200mA max. (volt drop 8V)
Operating distance	15 mm Max, detecting 20 mm dia. ferrous target
Target	20mm dia. target for maximum range
Start up delay	0 to 30 sec.
Cable	2m, 2 core, PVC sheathed
Accuracy	±/-2% of set speed
Indication	LED indication of input pulsed and output energised
Enclosure	Moulded polyester

212349

Mfrs. List No.	Order Code	1+	5+	10+
PU1TZA-DM1201	445-0292	113.60	107.92	100.99

Hall Effect Vane Sensors

Honeywell



H=10.9, W=13.2, D=19.1, Slot W=2.5, Slot D=7.4, Fixing centres=14 (dia=2.8)

Hall effect vane sensors include a Hall effect transducer and a magnet, and are operated by passing a ferrous vane through the gap between the two.

The sensor is housed in a miniature and rugged sealed package.

- Useful as limit switch by operating with single large vane
- Useful as tachometer sensor by operating with toothed wheels
- Wide temperature range
- Suitable in dusty or high ambient light environment where an optical sensor would be suitable
- Transient and reverse polarity protection

Supply voltage	4.5 to 26.5V dc	Current output	50mA
Supply current	5 to 18mA	Temperature range	-40°C to +150°C

212443

Termination	Mfrs. List No.	Order Code	1+	10+	25+	100+
Leadwire	4AV16F	178-877	18.28	17.93	17.11	16.26

Ultrasonic Transducers

Ultrasonic Transducer

Standard - Open Air Type



The Standard (S) Open Air type transducers consist of a piezo-ceramic disc bender mounted at the node of its fundamental resonant frequency, a quarter wavelength conical metal resonator bonded in the centre of the disc, acting as a rigid piston movement. This special construction provides high sensitivity and Sound Pressure Level (SPL), wider bandwidth, excellent temperature and humidity durability and stable electrical and mechanical characteristics. The S type transducers are suitable for continual driving circuits, such as Doppler motion detectors.

Applications

- Alarm systems
- Liquid level measurement
- Anti-collision devices
- Moving object detectors/counters
- Remote control devices
- Robotics

Centre Freq. (kHz)	SPL (dB)	Sensitivity (dB)	Drive Voltage Max. (rms)	Dimensions H x Dia. (mm)	Mfrs. List No.	Order Code
25	112	-62dB	20	12 x 16.2	250ST160	100-7326
25	112	-62dB	20	12 x 16.2	250SR160	100-7327
25	112	-62dB	20	14.2 x 18.2	250ST180	100-7328
25	112	-62dB	20	14.2 x 18.2	250SR180	100-7329
32.8	115	-62dB	20	9.6 x 16.2	328ST160	100-7330

Centre Freq. (kHz)	SPL (dB)	Sensitivity (dB)	Drive Voltage Max. (rms)	Dimensions H x Dia. (mm)	Mfrs List No.	Order Code
32.8		-67dB	20	9.6 x 16.2	328SR160	100-7331
40	120		20	12 x 16.2	400ST160	100-7332
40		-65dB	20	12 x 16.2	400SR160	100-7333
40		-65dB	20	12 x 16.2	400SR16P	100-7338
40	115		20	12 x 16.2	400ST120	100-7339
40		-67dB	20	12 x 16.2	400SR120	100-7340
40	112		10	6.7 x 9.7	400ST100	100-7341
40		-70dB	10	6.7 x 9.7	400SR100	100-7342
40		-70dB	10	6.7 x 9.7	400ST10B	100-7343
40		-70dB	10	6.7 x 9.7	400SR10B	100-7344

415216

Case Type	Mfrs. List No.	Order Code	1+	25+	100+
Bright Aluminium	250ST160	100-7326●	3.81	3.23	2.73
Bright Aluminium	250SR160	100-7327●	3.81	3.23	2.73
Bright Aluminium	250ST180	100-7328●	3.94	3.32	2.82
Bright Aluminium	250SR180	100-7329●	3.94	3.32	2.82
Bright Aluminium	328ST160	100-7330●	3.84	3.25	2.75
Bright Aluminium	328SR160	100-7331●	3.84	3.25	2.75
Bright Aluminium	400ST160	100-7332●	3.67	3.11	2.63
Bright Aluminium	400SR160	100-7333●	3.67	3.11	2.63
Plastic	400SR16P	100-7338●	2.24	1.89	1.61
Bright Aluminium	400ST120	100-7339●	3.75	3.18	2.70
Bright Aluminium	400SR120	100-7340●	3.75	3.18	2.70
Bright Aluminium	400ST100	100-7341●	2.88	2.55	2.11
Bright Aluminium	400SR100	100-7342●	2.88	2.55	2.11
Black Aluminium	400ST10B	100-7343●	2.97	2.62	2.15
Black Aluminium	400SR10B	100-7344●	2.97	2.62	2.15

Ultrasonic Transducer Standard - Enclosed Air Type



The Standard Enclosed (E) Type Transducers can be used for outdoor installation, or, because of its special dust-proof construction, can be used in a dusty atmosphere. The transducers consist of a metal housing with integral diaphragm, which operates at resonance on the first harmonic overtone. The backs of the transducers are completely sealed with resin, protecting from exposure to the environment. Although they are of a watertight construction, it is not recommended that they be used underwater. Due to its free vibration and un-damping characteristics, the (E) type transducers are suitable for continual drive circuits, such as Doppler motion detectors.

Applications

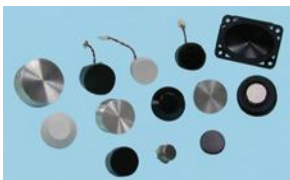
- Alarm systems
- Liquid level measurement
- Anti-collision devices
- Moving object detection/counters
- Remote control devices
- Robotics

Centre Freq. (kHz)	SPL (dB)	Sensitivity (dB)	Drive Voltage Max. (rms)	Dimensions H x Dia. (mm)	Mfrs List No.	Order Code
32.8	113		20	12 x 25	328ET250	100-7345
32.8		-67dB	20	12 x 25	328ER250	100-7346
40	115		15	12 x 18	400ET180	100-7347
40		-70dB	15	12 x 18	400ER180	100-7349
40	100		15	4.6 x 9.1	400ET080	100-7351
40		-80dB	15	4.6 x 9.1	400ER080	100-7352

415217

Case Type	Mfrs. List No.	Order Code	1+	25+	100+
Bright Aluminium	328ET250	100-7345●	7.29	6.15	5.22
Bright Aluminium	328ER250	100-7346●	7.29	6.15	5.22
Bright Aluminium	400ET180	100-7347●	6.99	5.91	5.02
Bright Aluminium	400ER180	100-7349●	6.99	5.91	5.02
Bright Aluminium	400ET080	100-7351●	6.75	5.70	4.83
Bright Aluminium	400ER080	100-7352●	6.75	5.70	4.83

Ultrasonic Transducer Pulse Transit



The Pulse/Tone Burst type transducers include two groups, open type (PT) and enclosed type (EP). Construction is similar to the standard air types, but an extra mechanical damper is added on the cone surface to minimise vibrations and hence reduce ringing. These types of transducer are specially designed for echo ranging systems with several transducers having asymmetric

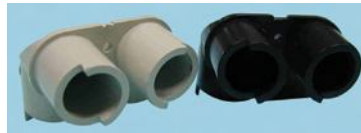
beam patterns designed specially to minimizing unwanted reflections being picked up from the ground.

- Car reversing aids
- Alarm systems
- Liquid level measurement
- Anti-collision devices
- Moving object detection/counters
- Remote control devices
- Robotics

Centre Freq. (kHz)	SPL (dB)	Sensitivity (dB)	Drive Voltage Max. (rms)	Dimensions H x Dia. (mm)	Mfrs List No.	Order Code
40	117	-65 dB	20	12 x 16.2	400PT160	100-7353
40	115	-68 dB	20	10 x 12.7	400PT120	100-7354
40	108	-75 dB	20	12 x 18	400EP18A	100-7355
40	103	-78 dB	20	9.1 x 14.1	400EP14D	100-7356
40	113	-72 dB	20	12 x 25	400EP250	100-7357

Type	Mfrs. List No.	Order Code	1+	25+	100+
Bright aluminium	400PT160	100-7353●	3.88	3.27	2.77
Bright aluminium	400PT120	100-7354●	4.02	3.40	2.89
Black aluminium	400EP18A	100-7355●	6.19	5.22	4.44
Black - Asymmetrical beam	400EP14D	100-7356●	9.41	7.92	6.75
Bright aluminium	400EP250	100-7357●	9.69	8.19	6.94

Ultrasonic Transducer Mirror Bender



This dual sensor unit houses both transmitter and receiver in a resin housing with 45° acoustic delay mirrors. This delay path offsets the ringing of the transmitter, and theoretically this means that objects can be measured at very close distances. The design combines high sensitivity and sound pressure level with excellent temperature and humidity durability.

design combines high sensitivity and sound pressure level with excellent temperature and humidity durability.

Applications

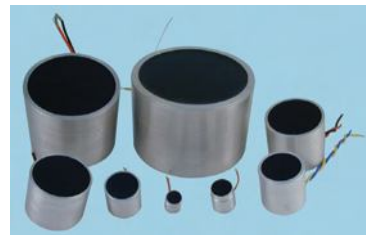
- Remote control devices
- Robotics
- Intrusion Alarms
- Energy saving equipments

Centre Freq. (kHz)	SPL (dB)	Sensitivity (dB)	Drive Voltage Max. (rms)	Dimensions H x W x D. (mm)	Mfrs List No.	Order Code
50	113	-67 dB	20	32.65 x 30.5 x 31	500MB120	100-7360

415219

Type	Mfrs. List No.	Order Code	1+	25+	100+
Dual Transducer	500MB120	100-7360●	9.41	7.92	6.75

Ultrasonic Transducer High Frequency - Narrow Beam



These transceiver type transducers operate at higher frequencies than the standard air types and are constructed using a silicon rubber matching technique. Providing narrow beams with little or no side lobes, these transducers are ideal for use as proximity sensors. They have high sensitivity and sound pressure levels.

Applications

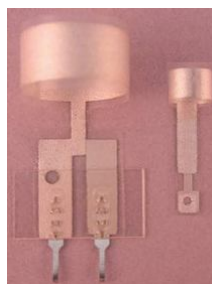
- Proximity detection
- Robotics
- Level control
- Short to long range measurement systems

Centre Freq. (kHz)	Sensitivity (dB)	Drive Voltage Max. (rms)	Dimensions H x Dia. (mm)	Mfrs List No.	Order Code
235	-73 dB	50	15 x 13	235AC130	100-7362

415220

Type	Mfrs. List No.	Order Code	1+	25+	100+
Pins, 9.3mm x 1mm	235AC130	100-7362●	57.15	47.63	40.84

Ultrasonic Transducers Omni-directional



These ultrasonic transmitters are constructed from a 30µm polymer film of polyvinylidene fluoride (PVDF) and offer omni-directional (360°) beam in the horizontal plane, and a ±40° beam in the vertical plane. Two models offer standard 40kHz and a higher 77kHz resonant frequency. The PVDF material offers a versatile solution for tough environmental conditions.

- Applications
- Alarm/security systems
- Anti-collision devices
- Moving object detection

Centre Freq. (kHz)	SPL (dB)	Resonance Q	Drive Voltage Max. (p-p)	Dimensions H x W x D. (mm)	Mfrs List No.	Order Code
40	95	10	150	22.5 x 11 x 11	400FS080	100-7365
77	69	5	150	16 x 4.9 x 4.9	800FS049	100-7366

415221

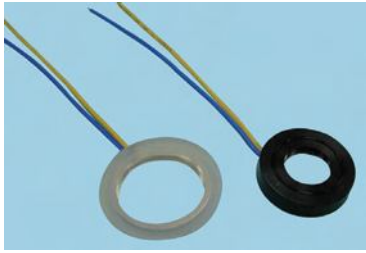
Mfrs. List No.	Order Code	1+	25+	100+
400FS080	100-7365●	1.90	1.60	1.36
800FS049	100-7366●	1.81	1.53	1.30



Ultrasonic Transducers - continued

Ultrasonic Transducers

Piezoelectric Atomiser



The ultrasonic atomizing transducer uses a high Q hard type piezoelectric ceramic element and is ideal for atomizing liquids. A very fine mist, having a particle diameter of only a few microns, can be generated. The process also sterilizes water.

- Piezoelectric ceramic element clad with stainless steel for corrosion resistance
- Fine and consistent particle size of less than 3µm
- High atomizing efficiency >400 cc / hour
- High stability and durability

Applications

- Humidification in refrigerated food displays and displays
- Humidification in living environments and air conditioning plants
- Inhalation and disinfecting equipment
- Humidification in industrial process control for lubrication and coating
- Nebulisers

Operational Life (Hrs)	Atomising Quality (cc/hr)	Water Level (mm)	Input Power (W)	Resonant Freq. (MHz)	Dimensions H x W x D. (mm)	Mfrs List No.	Order Code
>6000	400	45	30	1.65	H = 5.5, Dia = 30.5	M165D25	100-7369

415223

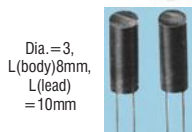
Mfrs. List No.	Order Code	1+	25+	100+
M165D25	100-7369●	9.69	8.19	6.94

Sonar Ranging Module

Ultrasonic Development Kit



W = 27.5, D = 19mm



H=1.45, W=8.66, D=3.91mm

Ultrasonic ranging development module The SRM400 Development Kit is an ultrasonic sonar ranging module, designed specially to work with the Prowave PT or EP type transducers. This module provides a short learning curve for the development of car reversing systems, and other distance measurement systems, for design engineers who are not very familiar with analog circuits and/or the operation of ultrasonic transducers. The SRM400 module contains a module board, a 400EP14D enclosed transducer and a detailed electrical schematic.

Ultrasonic Sonar ranging IC This chip consists of an external tunable RC oscillator with a special feature of automatic frequency tracing, which compensates the resonant frequency shift of the transducer due to temperature changes. A fixed gain pre-amplifier can be tailored to compensate for varying transducer sensitivities. The 32 steps time controlled variable gain amplifier slope can be modified by adjusting the frequency of the system clock. The onboard comparator converts the analog signal of the returning echo to a TTL level digital signal for use with an external microprocessor.

- Operating Voltage 6 - 10Vdc
- Broadband output up to 250KHz
- Built-in variable RC oscillator to match transducers with different frequencies
- High gain amplifier - time controlled 32 steps
- Integrated band pass filter to reduce external component count
- Bi-direction I/O pins to simplify control function when transmitting or receiving
- Adjustable system clock

415060

Module	Mfrs. List No.	Order Code	1+	25+	100+
IC	SRM400	100-7370●	21.58	17.99	15.42
Crystal - 40 kHz	PW0268	SMD-100-7371●	3.11	2.61	2.22
	S40000	100-7372●	0.94	0.81	0.69

Technical information at your fingertips

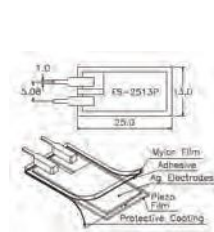
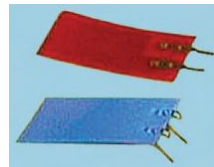


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Piezoelectric Film Sensors

Motion / Vibration / Impact



The polymer film of polyvinylidene fluoride (PVF2) provides superior performance to many other piezo crystal or ceramic materials. The strain constant (g value) is 10 - 20 times larger than normal piezo ceramic and is therefore ideal for converting mechanical to electrical energy.

- High mechanical-electrical coefficient
- Low mechanical and acoustic impedance
- High resistance to moisture
- Pliant, flexible, tough and lightweight
- Self generated voltage, non-contact, rustless and free of sparking

Applications

- Vibration and motion sensors
- Coin and impact sensors
- Low weight accelerometer
- Pressure or force sensors
- Keyboards, keypads and touch panels
- Microphone and headset speakers

Voltage Sensitivity	Transverse Sensitivity	Resonant Frequency	Capacitance Sensitivity	Dimensions H x W. (mm)	Mfrs List No.	Order Code
70 mV/ms ⁻²	80	80Hz ±10	1.5nF ±30%	13 x 25	FS-2513P	100-7374

415224

Ultrasonic Transducers



10mm Dia. Type
H=6.6, dia.=9.8
Leads L=8.5,
dia.=0.5
Lead spacing=4.8

10mm Housing
Bracket
H=19, W=12,
D=16
Mtg=4.5 dia.



16mm Dia. Type (Open)
H=12, Dia.=16
Leads L=10, Dia.=1.2
Lead spacing=10

Ultrasonic transmitters and high sensitivity receivers designed for sending and receiving ultrasonic sound in the form of continuous or modulated waves through the air at 40kHz.

- Typical applications: remote control, proximity sensors, intruder alarms, motion detectors and data transmission
- Pair of housings are suitable for mounting 10mm dia. transducers. The housing enables the transducer to be aligned in a number of fixed positions relative to its mounting bracket, and is ideal for non-PCB applications

	10mm Dia. Open	16mm Dia. Open
Sensitivity, transmitter	110dB	106dB
Sensitivity, receiver	-70dB	-65dB
Resonant frequency	40±1KHz	40±1KHz
Typical operating distance	5m	5m
Direction angle	30°	30°
Input voltage (max), transmitter	10V rms	20V rms
Capacitance (typ.)	2000pF	1100pF
Operating temperature	-20°C to +60°C	-20°C to +60°C

212433

	Order Code	1+	25+	100+
10mm Dia. (Open) Transmitter	213-214	3.16	2.76	2.27
Receiver	213-226	3.16	2.76	2.27
Housings (pair)	213-238	1.89	1.65	1.31
16mm Dia. (Open) Transmitter	118-1092●	5.18	4.57	3.50
Receiver	118-1093●	5.18	4.57	3.50

Magnetic Sensors

Hall-Effect Gear Tooth Sensor



- Senses ferrous metal targets
- Digital current sinking output (open collector)
- Better signal-to-noise ratio than variable reluctance sensors
- Excellent low speed performance
- Output amplitude not dependant on RPM
- Sensor electronically self adjusts to slight variations in runout and variation in temperature
- Fast operating speed - over 100 kHz
- EMI resistant
- Reverse polarity protection and transient protection (integrated into Hall IC)
- Wide continuous operating temperature range

Honeywell

Product Type	Hall Effect Gear Tooth Sensor
Supply Voltage	4.5 to 24V dc
Output Type	Sink
Termination Type	Lead Wire
Operating Temperature Range	-40 to 150°C
Output Voltage	0.4V dc Max.
Vane & Gear Tooth Target Material	Cold Rolled Steel, 1018 or Low in Carbon (Annealed)
GT Target RPM	10 RPM Min, 3600 RPM Max.
Switching Time Rise (10% to 90%)	15 µs Max.
Switching Time Fall (90% to 10%)	1.0 µs Max.
Operate Point	3.3° ±1.25°
Release Point	4.4° ±2.50°
Supply Current (Max. @ 25°C)	20mA
Output Current (Max.)	40mA
GT Target Min Tooth Height	5.06mm
GT Target Min Tooth Width	2.54mm
GT Target Min. Tooth Spacing	10.16mm
GT Target Thickness	6.35mm
GT Target Thickness	101.6mm
GT Airgap	1.02mm to 2.03mm
Leakage Current Max.	10 µA
Differential	8.4° ±3.70°

449158

Mfrs. List No.	Order Code	1+	10+	Price Each	50+	100+
1GT101DC	122-5630●	17.91	16.66	12.08	11.78	11.48

Hall-Effect Gear Tooth Sensor Dual Differential



- Enhanced target resolution
- Dynamic offset self calibration
- Near zero speed
- EMI hardened
- Short circuit protection
- Reverse voltage protection
- Open collector output
- Low jitter output
- Wide continuous operating temperature range

Product Type	Dual Differential - Hall-effect
Supply Voltage	4.5 to 18V dc
Supply Current	13.6mA
Output Type	Square Wave
Output High	≥Vs -0.5V
Output Low	≤0.5V
Output Current (Max.)	20mA
Termination Type	Axial Leaded - 555mm
Sensing air gap	0 to 2mm
Operating Temperature - Continuous	-40 to 150°C

505698

Mfrs. List No.	Order Code	1+	10+	Price Each	50+	100+
SNDH-T4L-G01	156-6216●	27.70	25.18	23.91	22.66	20.99

Magnetic Speed Sensor High Temperature



High Temperature VRS (Variable Reluctance Speed) sensors are designed for use in applications where the sensor is exposed to temperatures up to 260 C [450 F]. Passive VRS Magnetic Speed sensors are simple, rugged devices that do not require an

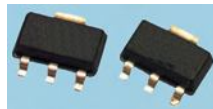
external voltage source for operation. A permanent magnet in the sensor establishes a fixed magnetic field. The approach and passing of a ferrous metal target near the sensor's pole piece (sensing area) changes the flux of the magnetic field, dynamically changing its strength. This change in magnetic field strength induces a current into a coil winding which is attached to the output terminals. The output signal of a VRS sensor is an ac voltage that varies in amplitude and wave frequency as the speed of the monitored device changes, and is usually expressed in peak to peak voltage (Vp-p). One complete waveform (cycle) occurs as each target passes the sensor's pole piece. If a standard gear were used as a target, this output signal would resemble a sine wave if viewed on an oscilloscope.

- Self-powered operation
- Direct conversion of actuator speed to output frequency
- Simple installation
- No moving parts
- Designed for use over a wide range of speeds
- Adaptable to a wide variety of configurations
- Housing diameter 6.4mm
- Stainless steel threaded housing
- 1220mm Teflon insulated 28 AWG leads
- -73°C to 230°C operating temperature range
- Output voltage 4.7 Vp-p to 125 Vp-p

526332

Mfrs. List No.	Order Code	1+	5+	Price Each	10+
MA3055S10	154-1025●	145.15	140.07	135.00	

Bipolar Hall-Effect Sensor



- Miniature construction: 2.4mm x 4.5mm plastic package
- Power consumption of only 5 mA Max at 4.5V dc for energy efficiency
- Digital current sinking output
- Bipolar magnetics for ring magnet applications
- High output current capability (20 mA)
- High speed - Operates from 0 kHz to over 100 kHz
- Broad temperature range of -40 to 125°C
- Built-in reverse polarity protection

Product Type	Bipolar Hall-Effect Sensor	Operate Point @ 25°C	45 G typ.
Package Style	Surface Mount	Release Point @ 25°C	-45 G typ.
Supply Voltage	4.5 to 24V dc	Leakage Current Max.	10 µA
Output Type	Sink	Response Time	4µs (typ.)
Magnetic Actuation Type	Bipolar	Supply Current	6.5mA
Operating Temperature Range	-40 to 125°C	Operate Point -40°C to 85°C	110G
Output Voltage	0.4V dc Max.	Release Point -40°C to 85°C	-110G
Supply Current (max @ 25°C)	10mA	Differential (typ. @ 25°C)	90G
Output Current (Max.)	20mA		

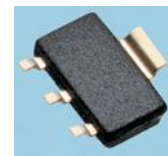
448949

Mfrs. List No.	Order Code	1+	10+	Price Each	50+	100+
SS50AT	122-5623●	1.55	1.38	1.24	1.13	1.03

Linear Position Sensor



122-5624



122-5626

The SS49E and SS59ET series economical linear hall-effect sensors are small, versatile linear hall-effect devices what are operated by the magnetic field from a permanent magnet or an electro magnet. The linear sourcing output voltage is set bt the supply voltage and varies in proportion to the strength of the magnetic field.

The integrated circuitry features low noise output, which makes it unnecessary to use external filtering. It also includes thin film resistors to provide increased temperature stability and accuracy. These linear hall sensors have an operating range of -40 to 100°C, appropriate for commercial, consumer and industrial environments.

- Miniature construction
- Power consumption of 6 mA @ 5V dc for energy efficiency
- Low voltage operation down to 3V dc
- Single current sourcing output
- Linear output for circuit design flexibility
- Low noise output virtually eliminates the need for filtering
- Thin film resistors for a stable and accurate output
- Temperature range from -40 to 100°C
- Repsponds to either positive or negative gauss

Product Type	Hall-Effect Linear Position Sensor
Supply Voltage	3.0 to 6.5V dc
Output Type	Source
Magnetic Actuation Type	Analog
Sensitivity @ 25°C	1.0 mV/G min., 1.4mV/G typ., 1.75mV/G max.
Operating Temperature Range	-40 to 100°C
Output Voltage	1.0mV/Gauss min., 1.4mV/Gauss typ., 1.75mV Max.
Linearity (% of span)	-0.007
Temperature Error (@ 25°C)	0.10 max./-0.10 min
Null Shift (%/°C)	
Supply Current (max @ 25°C)	10mA
Response Time	3µs
Null (@ 0 Gauss, 25°C)	2.25 V dc min., 2.50V dc typ., 2.75 V dc max.
Supply Current (typ. @ 25°C)	6mA
Temperature Error (≥25°C)	0.05 max. , -0.15 min.
Sensitivity (%/°C)	
Temperature Error (≤25°C)	0.185 max., -0.04 min.
Sensitivity (%/°C)	
Magnetic Range	± 650 Gauss min., ± 1000 Gauss typ.
Output Voltage Span	1.05 V dc to (Vs - 1.05V dc) min. 0.95V dc to (Vs - 0.95V dc) typ. 1.0 mA (Vs 3.0 V) min 1.5 mA (Vs 3.0V) typ.
Output Current	

449071

Connection Type	Mfrs. List No.	Order Code	1+	10+	Price Each	50+	100+
Radial Lead IC	SS49E	122-5624●	1.91	1.69	1.52	1.38	1.25
Surface Mount	SS59ET	SMD122-5626●	2.09	1.85	1.67	1.52	1.38

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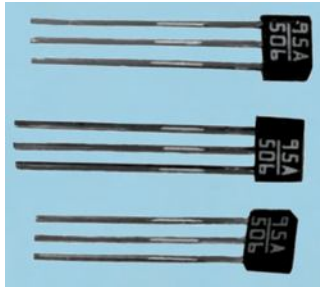
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Magnetic Sensors - continued

Miniature Ratiometric Linear Hall-Effect Sensor

Honeywell



The SS490 Series MRL (Miniature Ratio-metric Linear) sensors have a ratiometric output voltage, set by the supply voltage. IKT takes in proportion to the strength of the magnetic field.

- Small size
- Low power consumption
- Single current sinking or current sourcing linear output
- Built in Thin-Film resistors, laser trimmed for precise sensitivity and temperature compensation
- Rail-to-rail operation provides more useable signal for higher accuracy

- Responds to either positive or negative gauss
- Quad hall sensing element for stable output

Product Type
Supply Voltage
Output Type
Magnetic Actuation Type
Operating Temperature Range
Output Voltage

Hall-Effect Linear Position Sensor
4.5 to 10.5V dc
Sink / Source
Ratiometric
-40 to 150°C

Linearity (% of span)
Output Voltage Span (min.)
Supply Current (max @ 25°C)
Output Voltage Swing (Negative G)
Output Voltage Swing (Positive G)
Response Time
Output Current Typical Source
($V_s < 4.5$ V dc)
Output Current Minimum Source
($V_s < 4.5$ V dc)
Output Current Minimum Sink
($V_s < 4.5$ V dc)
Output Current Minimum Sink
($V_s < 5$ V dc)
Output Voltage Span (typ.)
Response Time
Null (Output @ 0G)

0.2V dc to ($V_s - 0.2$ V dc) typ.
0.4V dc to ($V_s - 0.2$ V dc) min.
-0.1 % typ., -1.5% max.
0.4 V dc to ($V_s - 0.4$ V dc)
8.7mA @ 5 V dc
0.4 V dc
 $V_s - 0.4$ V dc
3μs
1.5 mA
1 mA
0.6 mA
1 mA
0.2 V dc to ($V_s - 0.2$ V dc)
3μs
2.50 V dc \pm 0.075 V dc

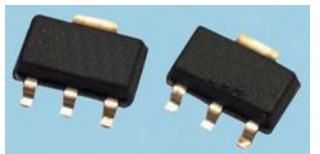
Sensitivity	122-5627	3.125 mV \pm 0.125 mV/G	147-0592	3.125 mV \pm 0.094 mV/G
Temperature Error (@ 25°C)		-0.06% Min., 0.06% Max.		-0.04% Min., 0.04% Max.
Null Shift (%/°C)		-0.01% Min., 0.05% Max.		-0.01% Min., 0.05% Max.
Temperature Error (@ 25°C)		-67 mT to 67mT (-670G to 670G)		-67 mT to 67mT (-670G to 670G)
Sensitivity (%/°C)		-60 mT to 60 mT (-600G to 600G)		-60 mT to 60 mT (-600G to 600G)
Magnetic Range (typ.)				
Magnetic Range (min.)				

449088

Mfrs. List No.	Order Code	1+	10+	25+	50+	100+
SS495A	122-5627●	3.21	2.86	2.57	2.35	2.12
SS495A1	147-0592●	2.40	--	--	--	--

Hall-Effect Digital Position Sensor

Honeywell



- Quad hall design virtually eliminates mechanical stress effects
- Temperature compensated magnetics
- Super high sensitivity available
- Symmetry of operate/release points about zero gauss (bipolar/latching)
- Low current consumption
- High output current capability

Package Style
Supply Voltage
Output Type
Operating Temperature Range
Output Voltage
Switching Time Rise (10% to 90%)
Switching Time Fall (90% to 10%)
Supply Current (max @ 25°C)
Output Current (Max.)
Operate Point @ 25°C
Release Point @ 25°C
Leakage Current Max.
Differential

122-5620
Surface Mount Device
3.8 to 30.0V dc
Sink
-40 to 150°C
0.4V dc Max.
1.5μs Max.
1.5μs Max.
7.5mA typ.
20mA
8.5 mT [85 G] typ.
5.5 mT [55 G] typ.
10 μA
3.0 mT [30 G] Typ.

122-5621
Surface Mount Device
3.8 to 30.0V dc
Sink
-40 to 150°C
0.4V Max.
1.5μs Max.
1.5μs Max.
7.5mA typ.
20mA
5.0 mT [50 G] typ.
-5.0 mT [-50 G] typ.
10 μA
10.0 mT [100 G] Typ.

448290

Magnetic Actuation	Mfrs. List No.	Order Code	1+	10+	25+	50+	100+
Unipolar	SS541AT	SMD 122-5620●	1.92	1.70	1.52	1.38	1.26
Bipolar Latch	SS561AT	SMD 122-5621●	2.47	2.18	1.97	1.78	1.62

Hall-Effect Linear Position Sensor

Honeywell



- Single current sinking or current sourcing linear output
- Improved temperature stability
- Standard mounting centers
- Laser trimmed thin film and thick film resistors minimize sensitivity variations and compensate for temperature variations

Package Style
Supply Voltage
Output Type
Magnetic Actuation Type
Operating Temperature Range
Linearity (% of span)
Supply Current (max @ 25°C)
Output Current (Max.)
Sensitivity @ 25°C
Temperature Error (@ 25°C)
Null Shift (%/°C)
Temperature Error (@ 25°C)
Sensitivity (%/°C)
Magnetic Range (min.)

122-5622
Ceramic
6.6 to 12.6V dc
Sink / Source
Ratiometric
-40 to 125°C
-0.8% typ., -1.5% max.
30mA typ.
1mA
25 mV \pm 5 mV/G
-0.1% min., 0.1% max.
-0.055% min., 0.02% max.
-10 mT to 10 mT
[-100 G to 100 G]
3μs (typ.)
4.0V dc \pm 0.08V dc

Response Time
Output Voltage (0 G @ 25°C)

448296

Mfrs. List No.	Order Code	1+	+	+	+	+
SS94A1F	122-5622●	18.129	--	--	--	--

Digital Hall Effects Sensors

Honeywell



- Negative temperature coefficient for temperature stability
- High current capability to 50mA
- Quad Hall design to eliminate mechanical stress
- Operating temperature -40°C to +150°C
- SS400 - TO92E Package

SS400 Series

Description	Mag. Characteristic @ 25°C			Mfrs List No.	Order Code
	Max. Op.	Min. Rel.	Min. Dif.		
Bi-Polar \pm 60 Gauss	60	-60	15	SS411A	311-1465
Unipolar 115 Gauss@25°C	115	20	20	SS441A	311-1477
Latching Bi-Polar \pm 115 Gauss	50	85	-85	SS461A	311-1489
Latching Bi-Polar \pm 180 Gauss	180	-180	200	SS466A	311-1490
Unipolar 180 Gauss@25°C	180	75	25	SS443A	311-1507

212423/406092

Description	Package	Order Code	Price Each		
			1+	25+	100+
Bi-Polar \pm 60 Gauss	TO92E	311-1465	1.16	1.11	1.04
Unipolar 115 Gauss@25°C	TO92E	311-1477	1.16	1.11	1.04
Latching Bi-Polar \pm 115 Gauss	TO92E	311-1489	1.16	1.11	1.04
Latching Bi-Polar \pm 180 Gauss	TO92E	311-1490●	1.22	1.16	1.08
Unipolar 180 Gauss@25°C	TO92E	311-1507	1.16	1.11	1.04

SS40A Bipolar Hall-Effect Sensor

Honeywell



- Miniature construction: 3.0x4.0mm plastic package
- Power consumption of only 5mA Max. @ 4.5V dc for energy efficiency
- Digital current sinking output
- Bipolar magnetics for ring magnet applications
- High output current capability (20mA)
- High speed - operates from 0 KHz to over 100 KHz
- Broad temperature range of -40 to 125°C
- Built-in reverse polarity protection

Package Style
Supply Voltage
Output Type
Magnetic Actuation Type
Operating Temperature
Output Voltage
Operate Point @ 25°C
Release Point @ 25°C

Radial Lead IC
4.5 to 24.0V dc
Sink
Bipolar
-40 to 125°C
0.4V dc
45 G Typ.
-45 G Typ.

Leakage Current Max.
Output Current (Max.)
Supply Current (Max. @ 25°C)
Supply Current (Typ. @ 25°C, 24V dc)
Response Time
Operate Point -40°C to 85°C
Release Point -40°C to 85°C
Differential (Typ. @ 25°C)

10 μA
20mA
10mA
6.5mA
4 μs (Typ.)
110G Max.
-110G Max.
90G

419647

Mfrs. List No.	Order Code	1+	5+	10+	25+	+
SS40A	108-2268●	0.91	0.83	0.71	0.63	--

Over 480,000 products online



SR13/15 Series Solid State Position Sensors

Honeywell



Snap-in: L=20, W=10.7, D=7.6
Flat Mount: L=20, W=4.3, D=7.6

This range of snap-in and flat mount sensor packages incorporate Honeywell's proven SS400 series solid state sensors.

- 3.8 to 30V dc supply voltage
- Digital current sinking output
- Snap-in or flat mount packages
- Quad hall design eliminates stress effects
- Temperature compensated magnetics
- Bipolar, unipolar and latching magnetics
- High output capability, 50mA absolute maximum
- Operating temperature: -40°C to +150°C
- 24AWG radox lead wire

	SR13C-A1 Unipolar Snap-in	SR13D-A1 Unipolar Snap-in	SR13R-A1 Latching Snap-in	SR15C-A3 Unipolar Flat Pack
Max. Operating Force	215	135	110	215
Min. Release Force	60	15	-110	60
Min. Differential Force	10	8	50	10

233135

	Mfrs. List No.	Order Code	Price Each		
			1+	5+	10+
Unipolar Snap-in	SR13C-A1	389-0156	3.88	3.70	3.49
Unipolar Snap-in	SR13D-A1	389-0168	4.53	4.29	4.07
Latching Snap-in	SR13R-A1	389-0170	4.53	4.29	4.07
Unipolar Flat Pack	SR15C-A3	389-0181	3.88	3.70	3.49

Magnetoresistive Digital Sensor

Honeywell



Magnetoresistive material integrated on silicone. Can achieve large sensing distances when used with conventional magnets.

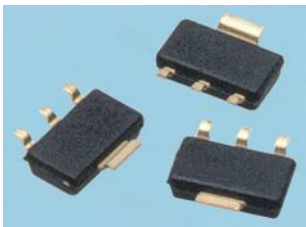
- Low gauss operation (typical op. 15 gauss)
- Digital current sinking
- Omni polar (N & S pole sensing)
- 0-100KHz
- Miniature package
- 3 pin in-line 0.1" centre
- Operating temperature -40°C to +125°C
- Supply voltage 6 to 24V dc

212412

	Mfrs. List No.	Order Code	Price Each			
			1+	10+	25+	100+
	2SS52M	311-1519	1.52	1.48	1.41	1.34

SS552MT Surface Mount Sensor

Honeywell



SS552MT is a digital position sensor in an SOT-89 style surface-mount package with omnipolar magnetic action. The sensor has magnetoresistive material integrated on silicon and encapsulated in a plastic package. The integrated circuit provides a digital output in response to very low magnetic fields.

Package Style	Surface Mount	Output Voltage	0.4V dc
Supply Voltage	3.8 to 30.0V dc	Switching Time Rise (10 to 90%)	0.2µs Typ.; 1.5µs Max.
Output Type	Sink	Switching Time Fall (90 to 10%)	0.1µs Typ.; 1.5µs Max.
Magnetic Actuation Type	Omnipolar	Output Current (Max.)	20mA
Operating Temperature	-40 to 150°C	Supply Current (Typ. @ 25°C)	10mA

419608

	Mfrs. List No.	Order Code	Price Each			
			1+	5+	10+	25+
	SS552MT	108-2265	1.72	1.55	1.37	1.20

High Sensitivity Magnetic Sensors

Honeywell



Key features are:

- ±6 Gauss Field Range for HMC10xx
- 80 Gauss Saturation field for HMC15xx
- ±20mV unamplified full scale output
- 0 to 10 MHz frequency response
- -55°C to +125°C operating temperature

Key benefits are:

- Embedded set/reset function nulls out effects of unwanted ambient magnetic fields
- Miniature surface mount package enables automated assembly onto printed circuit boards
- Solid state construction provides high reliability

Use these high sensitivity Magnetic Sensors to easily obtain accurate compass heading (HMC10xx models) direction, or for precise, non-contact measurement of linear/angular position (HMC15XX models) in many applications. HMC10xx models are ideal for handheld, battery powered appliances such as position intelligent cellular telephone handsets, GPS receivers, short range walkie talkies, or wrist watches. Products excel in compasses embedded in automobile rear view mirrors as well. Detailed applications information describes required signal conditioning electronics.

HMC15xx models are affordable solutions for non-contact valve position measurement in food and beverage applications. The high sensitivity enables use of a small low cost magnet that can be positioned up to 2cm away from sensor.

Ideal solution for rotary position measurement in engine control applications such as measuring engine valve position or accelerator pedal position in electronic throttle control assembly.

232414

	Mfrs. List No.	Order Code	Price Each			
			1+	10+	25+	100+
Single axis, 8 pin SIP	HMC1021Z	722-0108	20.71	18.62	16.94	16.01
Single axis, 8 pin SOIC	HMC1501	389-0120	16.01	15.21	14.40	--
Dual axis, 8 pin SOIC	HMC1512	389-0132	18.29	17.40	16.48	--

Magnetic Sensor Hybrid - HMC2003

Honeywell



PCB = 27x9, Pin spacing = 2.54x15.24

Magnetic hybrid includes 3 magneto-resistive based sensors to sense x, y and z axes, and 3 instrumentation grade amplifiers. 20 pin DIP package.

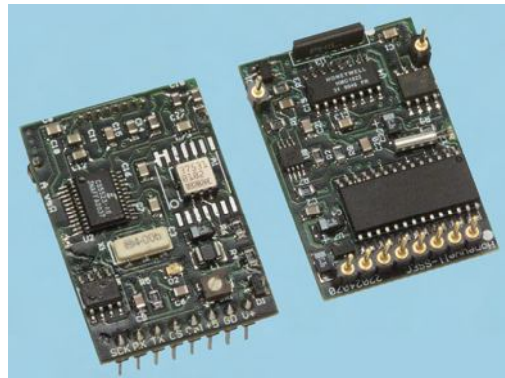
Field range	±2 gauss	Resolution	70 µgauss
Full scale output	4.5V		

212328

	Mfrs. List No.	Order Code	Price Each			
			1+	5+	10+	25+
	HMC2003	722-0121	183.01	164.69	161.04	153.09

HMR3200/HMR3300 Digital Compass Solutions

Honeywell



Features

- Compact solution on a 1.0" by 1.5" PCB
- Precision compass accuracy
- Tilt-compensated (HMR3300 only)
- 0.5° repeatability
- 8Hz continuous update rate
- Hard-Iron compensation routine
- -40 to 85°C operating temperature range
- UART and SPI communication

Benefits

- Small size and pin interface for daughter/motherboard integration
- ±1° at level heading accuracy, ±0.1° resolution
- Up to ±60° of pitch and roll angles using a MEMS accelerometer (HMR3300)
- Magnetoresistive sensor technology for consistency
- Rapid heading computations for control system applications
- User driven calibration to null stray fields
- Consumer and Industrial environment uses
- Intuitive command language

419658

	Mfrs. List No.	Order Code	Price Each			
			1+	5+	10+	25+
	HMR3200	108-2273	291.69	278.82	268.09	244.44
	HMR3300	108-2274	328.14	312.05	301.33	278.76

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Proximity Switches - Magnetic

Reed Sensor

Ferromagnetic Metal Detection



H = 10, W = 32.4, D = 16.7mm

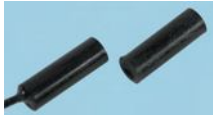
Contact Form

Contact resistance mR (max)	150	Switch carry current A (max)	1.75
Switch power W (max)	10	Breakdown voltage V dc	310
Switch voltage V dc (max)	200	Temperature, operating °C	-20 to +85
Switching current A (max)	0.5		

417770

Sensing direction	Mfrs. List No.	Order Code	1+	10+	25+	50+
Front	MK02/0-1A71-500W	107-9473	14.74	12.29	11.05	8.10
Above	MK02/1-1A71-500W	107-9474	14.34	11.95	10.75	7.88

Mini Firecracker Reed Sensor

L Barrel = 15.24mm
Ø = 5.10mm

- 2 part magnetically operated position sensor
- N/O contact
- Hermetically sealed
- 300mm cable

Typical Sensing Applications

- Security systems
- Position and limit sensing
- Linear actuators
- Level sensing

Contact	NO	Breakdown voltage	170V dc
Power	3W	Switching current	0.25A
Switching voltage	100V dc	Carry current	0.5A
		Operating temperature	-40°C to +105°C
Type		Mfrs. List No.	Order Code
Sensor		59020-1-S-02-A	554-0653
Actuator		57020-000	554-1499

341354

Type	Order Code	1+	5+	10+	25+	50+
Sensor	554-0653	3.38	3.07	2.84	2.59	2.37
Actuator	554-1499	2.29	2.09	1.92	1.75	1.58

Firecracker Reed Sensor

L = 36mm
Ø = 6.22mm

- 2 part magnetically operated position sensor
- N/O, N/C and C/O contact options
- Hermetically sealed
- 300mm wires

Typical Sensing Applications

- Security systems
- Position, limit and Level
- Linear actuator

Contact	5540665		5540690		
Power	NO		NC		
Switching voltage	10W		5W		
Breakdown voltage	200V dc		175V dc		
Switching current	250V dc		200V dc		
Carry current	0.5A		0.25A		
Operating temperature	1.2A		1.5A		
	-40°C to +105°C		-40°C to +105°C		
Type	Mfrs. List No.	Order Code	Type	Mfrs. List No.	Order Code
Sensor	59025-1-S-02-A	554-0665	Actuator	57025-000	178-2630
Sensor	59025-4-S-02-A	554-0690			

341355

Type	Contacts	Order Code	1+	5+	10+	25+	50+
Sensor	NO	554-0665	2.00	1.82	1.68	1.53	1.40
Sensor	NC	554-0690	1.83	1.66	1.53	1.40	1.27
Actuator		178-2630	1.25	--	--	--	--

Reed Sensor

Magnet Detection



Products for tomorrow...

Products for tomorrow...

L (body) = 25.5, Dia. = 5.75mm

This sensor is a magnetically operated proximity switch housed in a cylindrical case with an interconnecting cable 500mm in length. The sensor is designed to be mounted on a fixed surface with the actuating magnet on the moving surface. Introduction or removal of the magnetic field determines the opening of the reed switch.

Contact Form	Contact Form		
Contact resistance mR (max)	150	Switch carry current A (max)	1.5
Switch power W (max)	10	Breakdown voltage V dc	200
Switch voltage V dc (max)	180	Temperature, operating °C	-20 to +85
Switching current A (max)	0.5		

417773

Mfrs. List No.	Order Code	1+	10+	25+	50+
MK03-1A71B-500W	107-9476	4.04	3.37	3.03	2.23

Reed, Plastic Housing



Rectangular switch: 30x20x7, Fixing centres=16 (slots 6x3.3)
Rectangular actuator: 30x20x7, Fixing centres=16 (slots 6x3.3)
Cylindrical switch: L=28, Dia.=6, Cylindrical actuator: L=19, Dia.=6

- Magnetic proximity switches with hermetically sealed contacts
- Suitable for systems, position sensing, level sensing, security, flow sensing, etc.
- Choice of normally open, normally closed or changeover contacts (Forms A, B or C)
- Rectangular or cylindrical polystyrene housing
- No maintenance required
- Rectangular version has two slotted fixing holes for easy fitting

Switch contacts operate when the magnet actuator moves in close proximity to the switch, 8mm min. for rectangular version and 5mm min. for cylindrical version.

	SPNO	5VA, SPCO, SPNC	20VA, SPCO
Switching current	0.5A max.	0.25A max.	1A max.
Switching voltage	240V ac max.	175V ac max.	150V dc max.
Switching capacity	10VA max.	5VA max.	20VA max.
Operating temperature	-20°C to 70°C	-20°C to 70°C	-20°C to 70°C

Changeover contacts=white-common, green-normally open, brown-normally closed

21223

Switches	Mfrs. List No.	Order Code	1+	25+	100+	250+
Rectangular SPNO	PSA240/30	607-186	3.85	3.53	3.02	2.81
Rectangular SPNC	PSB175/30	721-3440	5.16	4.52	3.89	3.58
Rectangular SPCO	PSC175/30	607-198	5.22	4.80	4.14	3.81
Rectangular SPCO, 20VA	PSC150/30	732-000	9.13	7.99	6.85	6.31
Cylindrical SPNO	PRA240/30	607-216	3.91	3.58	3.09	2.85
Cylindrical SPCO	PRC175/30	607-228	5.55	4.63	3.99	3.68
Magnets						
Rectangular	PSM	607-204	2.32	2.05	1.73	1.56
Cylindrical	PRM	607-230	0.81	0.70	0.59	0.52

Reed Sensor
Magnet Detection

Products for tomorrow...



H = 5.9, W = 23, D = 19.4mm



H = 5.9, W = 23, D = 13.9mm

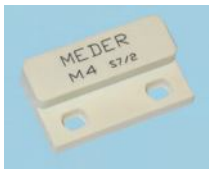
MK04 / MK05 sensors are magnetically operated Reed proximity switches designed for screw mounting. The sensor should be mounted on a fixed surface with the actuating magnet on the moving surface. Introduction or removal of the magnetic field determines the closing and opening of the Reed Switch.

Contact Form	Contact Form		
Contact resistance mR (max)	150	Switch carry current A (max)	1.5
Switch power W (max)	10	Breakdown voltage V dc	200
Switch voltage V dc (max)	180	Temperature, operating °C	-20 to +85
Switching current A (max)	0.5		

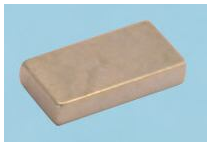
417779

Mfrs. List No.	Order Code	1+	10+	25+	50+
MK04-1A71B-500W	107-9477	2.69	2.24	2.02	1.47
MK05-1A71B-500W	107-9478	1.88	1.56	1.40	1.03

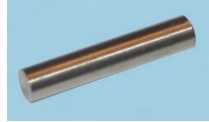
Sensor Magnets



M4



NdFeB



Bar

AlNiCo bar magnets are suitable for the operation of most Reed Switches and should ideally be the moving part of the sensing application. The selection of the magnet and the sensitivity of the Reed Switch will determine the Pull-In and Drop-Out distances.

SmCo (samarium cobalt) and **NdFeB** (neodymium iron boron) magnets are made from rare earth materials and have especially good magnetic properties concerning stability and energy product.

Dimensions		Dimensions		Dimensions	
Order Code	H (mm)	W (mm)	D (mm)	Order Code	H (mm)
107-9492	5.9	23	13.9	107-9497	4
107-9493	27	7.5		107-9498	4
107-9494	12	3		107-9500	15
107-9495	19	4		107-9501	5

Mfrs. List No.	Order Code	1+	10+	25+	50+
AlNiCo500					
MAGNET M4	107-9492	1.100	0.910	0.820	0.610
ALNiCO500 7.5X27MM	107-9493	0.860	0.700	0.640	0.460
ALNiCO500 3X12MM	107-9494	0.250	0.210	0.188	0.139
ALNiCO500 4X19MM	107-9495	0.330	0.270	0.240	0.182
ALNiCO500 5X22MM	107-9496	0.890	0.740	0.670	0.480
SmCo					
SMCO5 3X4MM	107-9497	0.520	0.420	0.380	0.290
SMCO5 5X4MM	107-9498	0.530	0.440	0.400	0.290
NdFeB					
NDFEB 8X15MM	107-9500	0.600	0.490	0.440	0.330
NDFEB 10X5X1.9MM	107-9501	0.480	0.400	0.370	0.270

Proximity Switch



Contact Style	Normally Open	Switching Distance	10mm Min.
Switching Capacity (Resistive)	10 W/VA Max.	Operating Temperature Range	-20 to 85°C
Switching Voltage	400V ac Max.	Storage Temperature Range	-25 to 90°C
Switching Current	0.5A Max.	Case Material	Blue Nylon 6.6
Carry Current	1.0A Max.	Dimensions (WxHxD)	14x6x20mm
Breakdown Voltage	600V dc Min.	Cable	2 x Round 0.14mm ² PVC covered grey and insulated brown/white

Contact Resistance 150 mΩ Max.

Description	Mfrs. List No.	Order Code	1+	50+	200+	1K+
Proximity Switch	MMPSA 240/100	117-3767	6.90	5.24	4.19	3.84
Magnet	MMPSM	117-3768	3.38	2.61	2.10	1.92

Reed, Plastic Housing

Miniature



Switch: 20 x 15 x 7
Actuator: 20 x 15 x 7

Fixing centres = 10 (slots 6 x 3.3)

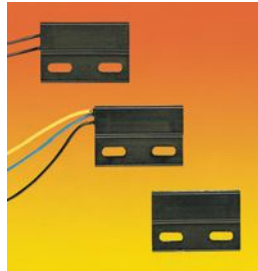
Switch contact operates when the magnet actuator moves in close proximity to the switch, typically 5mm.

Contacts	(Form A)	Switching distance, min.	5mm
Switching voltage, max.	ac	Operating temperature	-20°C to 85°C
Switching current, max.		Case material	ABS
Switching capacity, resistive	VA	Cable length	1m, PVC insulated
Contact resistance, max.	mΩ		

Mfrs. List No.	Order Code	1+	50+	200+
MMPSA 240/100	117-3767	6.90	5.24	4.19
MMPSM	117-3768	3.38	2.61	2.10

Reed, Plastic Housing

Miniature



- Robust housing
- Nylon 6.6
- UL approved option
- Temperature range to 105°C
- Repeatability and reliability due to Reed Switch characteristics

Typical Sensing Applications

- Posting franking machines
- Door interlocks
- Hook switches
- Machinery interface
- Material handling

H = 19.5, W = 28.5, D = 6.4mm

Fixing Centres = 21mm, (PM102 magnet = 16mm. Slots 90° against body)

Switch Action	100-6783	100-6784	100-6785
SPST N/O - SPST	SPST N/O - SPST	SPST N/O, N/C - SPST	SPST N/O - SPST
Switching voltage	250V ac	100V ac	250V ac
Switching current	1.0A	0.3A	1.0A
Switching power	15W	3W	15W
Material	Nylon 6.6	Nylon 6.6	Nylon 6.6
Temperature Range	-30 to +105°C	-30 to +105°C	-30 to +105°C
Cable	2 x 24AWG PVC insulated	2 x 24AWG PVC insulated	2 x 24AWG PVC insulated

233625

Type	Mfrs. List No.	Order Code	1+	5+	10+
SPST NO	PS1011	100-6783	3.02	2.70	2.42
SPST CO	PS1031	100-6784	4.02	3.68	3.17
SPST NO (UL Recognised)	PS2011	100-6785	3.37	3.20	3.02
Magnet	PM101	372-0913	2.90	2.48	2.26
Magnet	PM102	372-0925	2.74	2.36	2.15

Reed Sensor - Mini Flange Mount

HAMLIN



L = 23.01mm
W = 14.0mm
D = 5.99mm
Ctrs = 14.0mm

Contact	NO	5541141	5541177
Power	10W		
Switching voltage	200V dc		175V dc
Breakdown voltage	250V dc		200V dc
Switching current	0.5A		0.25A
Carry current	1.2A		1.5A
Operating temperature	-40°C to +105°C		-40°C to +105°C

Type	Mfrs. List No.	Order Code	Type	Mfrs. List No.	Order Code
Sensor	59140-1-S-02-A	554-1141	Actuator	57140-000	178-2770
Sensor	59140-4-S-02-A	554-1177			

341398

Type	Contacts	Order Code	1+	5+	10+	25+	50+
Sensor	NO	554-1141	2.00	1.82	1.68	1.53	1.40
Sensor	NC	554-1177	3.28	2.99	2.76	2.53	2.29
Actuator		178-2770	1.82	--	--	--	--

Reed Sensor - Flange Mount

HAMLIN



L = 28.57mm
W = 19.05mm
D = 6.35mm
Ctrs = 15.88mm

Contact	NO	5541189	5541190	5541219
Power	10W			
Switching voltage	200V dc		300V dc	175V dc
Breakdown voltage	250V dc		450V dc	200V dc
Switching current	0.5A		0.5A	0.25A
Carry current	1.2A		1.5A	1.5A
Operating temperature	-40°C to +105°C		-20°C to +105°C	-40°C to +105°C

Type	Mfrs. List No.	Order Code	Type	Mfrs. List No.	Order Code
Sensor	59145-1-S-02-A	554-1189	Sensor	59145-4-S-02-A	554-1219
Sensor	59145-2-T-02-A	554-1190			



Proximity Switches - Magnetic - continued

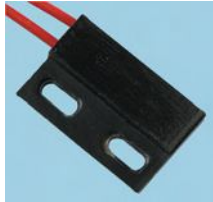
Reed Sensor - Flange Mount - continued

341399

Type	Order Code	1+	5+	10+	25+	50+
Sensor	554-1189	1.38	1.25	1.16	1.06	0.96
Sensor	554-1190	1.65	1.51	1.40	1.27	1.15
Sensor	554-1219	3.12	2.83	2.61	2.39	2.16

Reed Sensor - High Temperature Flange Mount

HAMLIN



L = 28.57mm
W = 19.05mm
D = 6.35mm
Ctrs = 15.88mm

- 2 part magnetically operated position sensor
- N/O contacts
- Hermetically sealed
- 300mm high temperature wires

Typical Sensing Applications

- Security system switch
- Position and limit
- Linear actuator
- Door switch

Contact	Power	Switching voltage	Breakdown voltage	Switching current	Carry current	Operating temperature
NO	10W	200V dc	250V dc	0.5A	1.2A	-40°C to +150°C
NO	10W	300V dc	450V dc	0.5A	1.5A	-40°C to +150°C
Type	Mfrs. List No.	Order Code	Type	Mfrs. List No.	Order Code	
Sensor	59135-1-S-02-A	554-1104	Actuator	57135-000	178-2691	
Sensor	59135-2-T-02-A	554-1116				

341397

Type	Contacts	Order Code	1+	5+	10+	25+	50+
Sensor	NO	554-1104	4.28	3.89	3.61	3.28	2.98
Sensor	NO	554-1116	4.58	4.15	3.85	3.50	3.19
Actuator		178-2691	1.26	--	--	--	--

Reed, Threaded Barrel

ASSEMBLY



730-208: L=28, Ø=M6
732-734: L=50, Ø=M12
732-746: L=90, Ø=M18
607-230: L=19, Ø=6
732-758: L=30, Ø=10
732-771: L=40, Ø=12.5
732-760: L=50, Ø=M12
Cable L=300 (all types)

- Threaded barrel housings for easy fitting and adjustment
- High switching capacity - up to 60VA and 120VA
- Suitable for a wide range of position sensing applications

Barrel size	M6	M12	M18
Contacts	SPNO (form A)	SPNO (form A)	SPNO (form A)
Switching voltage, max.	470Vac	230Vac	1500Vac
Switching current, max.	0.5A	3A	3A
Switching capacity, resistive	10VA max.	60VA max.	120VA max.
Contact resistance, max.	150mΩ	80mΩ	80mΩ
Switching distance, min	5 mm	8 mm	15 mm
Operating temperature		-20°C to 85°C	
Case material	Brass, nickel plated		
Order Code	730-208	732-734	732-746

212356

Switches	Mfrs. List No.	Order Code	1+	25+	100+	250+
M6 threaded	PTA470/30	730-208	12.33	10.82	9.32	8.56
M12 threaded	PTA230/30	732-734	18.95	16.61	14.28	13.12
M18 threaded	PTA1500/30	732-746	25.46	22.32	19.19	17.66
Magnets						
6mm dia	PRM	607-230	0.81	0.70	0.59	0.52
12mm dia	PRMM	732-758	3.05	2.72	2.36	2.15
M12 threaded	PTM12	732-760	15.83	15.02	13.09	10.97
18mm dia.	PRNM	732-771	4.72	4.22	3.64	3.33

Magnets - High Strength Discs
Miniature, Nickel Plated

ASSEMBLY



- Disc magnets made from strongest permanent magnet material
- Exceptional magnetic strength from small size
- All magnets nickel plated to reduce the onset of corrosion when used under normal conditions
- Suitable for use at temperatures up to 120°C
- Ideal for proximity sensor triggering or biasing where space is a premium

Distance (mm) at which magnets measure 1000 gauss M1219-1=4.1, M1219-2=2.2, M1219-3=1.8, M1219-4=1.2, M1219-5=0.6

Surface flux measurement (gauss) M1219-1=1500, M1219-2=2500, M1219-3=3200, M1219-4=2500, M1219-5=3500

Magnet material Neodymium Iron Boron

Grade/Energy density Grade N30H, max. energy density 30 MGOe (M1219-4 Grade N35H, energy density 35 MGOe)

Operating temperature 120°C max.

Note: M1219-4 has north-seeking pole identified with a dimple

Mfrs. List No. M1219-1=723-0345, M1219-2=723-0357, M1219-3=723-0369, M1219-4=723-0370, M1219-5=723-0382

212390/406096

Size (mm)	Order Code	1+	25+	100+	250+	1K+
Dia.=3, W=1	723-0345	0.55	0.44	0.36	0.32	0.28
Dia.=3, W=2	723-0357	0.58	0.47	0.38	0.34	0.31
Dia.=4, W=3	723-0369	0.73	0.69	0.60	0.51	0.46
Dia.=6, W=2	723-0370	0.73	0.69	0.60	0.51	0.46
Dia.=10, W=5	723-0382	0.73	0.68	0.60	0.51	0.46

Reed Threaded Barrel

GT



- Threaded housing
- Robust housing
- Adjustable fit using supplied mounting nuts
- Temperature range to 120°C
- Stainless Steel or Nylon 6.6
- Normally open
- Repeatability and reliability due to Reed Switch characteristics

100-6786 L=65, Dia = M10
100-6787 L=38.2, Dia = M8
730-841 L=45, Dia = M10

Typical Sensing Applications

- Security device
- Interlocked systems
- Food cutting machines
- Valve positioning
- Material handling
- Conveyor systems

	100-6786	100-6787
Switching voltage	250V ac	250V ac
Switching current	1A	1A
Switching power	15W	15W
Material	Stainless Steel	Nylon 6.6
Temperature Range	-30°C to +120°C	-30°C to +105°C
Cable	1 x 16/0.2mm PVC insulated	1 x 16/0.2mm PVC insulated

233611

Type	Mfrs. List No.	Order Code	1+	25+	100+
Sensor, Stainless Steel	PS-801	100-6786	14.93	13.73	12.34
Sensor, Nylon 6.6	PS811	100-6787	3.02	2.47	2.01
Magnet	FPM8	730-841	4.67	4.36	3.92

Reed Sensor - M8 Plastic threaded barrel

HAMLIN



L Barrel = 38.10mm
L Thread = 31.75mm
Ø = M8

- 2 part magnetically operated position sensor
- N/O and N/C contact options
- Hermetically sealed
- 300mm wires

Typical Sensing Applications

- Security system switch
- Position and limit
- Linear actuator
- Industrial process control

	554-0859	554-0860	554-0884
Contact	NO	NO	NC
Power	10W	10W	5W
Switching voltage	200V dc	300V dc	175V dc
Breakdown voltage	250V dc	450V dc	200V dc
Switching current	0.5A	0.5A	0.25A
Carry current	1.2A	1.5A	1.5A
Operating temperature	-40°C to +105°C	-20°C to +105°C	-40°C to +105°C

Type	Mfrs. List No.	Order Code	Type	Mfrs. List No.	Order Code
Sensor	59070-1-S-02-A	554-0859	Sensor	59070-4-S-02-A	554-0884
Sensor	59070-2-T-02-A	554-0860	Actuator	57070-000	178-2666

341360

Type	Contacts	Order Code	1+	5+	10+	25+	50+
Sensor	NO	554-0859	2.57	2.35	2.17	1.98	1.79
Sensor	NO	554-0860	1.83	1.66	1.54	1.40	1.28
Sensor	NC	554-0884	3.43	3.12	2.88	2.63	2.39
Actuator		178-2666	1.10	--	--	--	--

Reed Sensor Magnet Detection



L (overall) = 25, Thread = M5 x 0.5mm

The MK11 sensor is a magnetically operated Reed Sensor with screw thread enclosure supplied with a 500mm long interconnect cable. The sensor should be mounted on a fixed surface with the actuating magnet on the moving surface. Introduction or removal of the magnetic field determines the closing and opening of the Reed Switch.

Contact Form	Contact Form	
Contact resistance mR (max)	150	Switch carry current A (max)
Switch power W (max)	10	Breakdown voltage V dc
Switch voltage V dc (max)	180	Temperature, operating °C
Switching current A (max)	0.5	-20 to +85

417800

Pull in Range	Mfrs. List No.	Order Code	1+	10+	25+	50+
10 to 15mm	MK11-1A71B-500W	107-9483	7.00	5.83	5.25	3.84

Reed Sensor - M8 Stainless steel threaded barrel



L Barrel = 36mm
L Thread = 27.5mm
Ø = M8

Typical Sensing Applications

- Security systems
- Position and limit
- Linear actuator
- Industrial process control
- 2 part magnetically operated position sensor
- N/C contacts
- Hermetically sealed
- 300mm double insulated cable

Contact	5540800
Power	NC
Switching voltage	5W
Breakdown voltage	175V dc
Switching current	200V dc
Carry current	0.25A
Operating temperature	1.5A
	-40°C to +105°C

Type	Mfrs. List No.	Order Code	Type	Mfrs. List No.	Order Code
Sensor	59060-4-S-02-A	554-0800	Actuator	57060-000	554-1530

341348

Type	Contacts	Order Code	1+	5+	10+	25+	50+
Sensor	NC	554-0800	18.34	16.68	15.45	14.06	12.77
Actuator		554-1530	9.84	8.93	8.28	7.54	6.84

Reed Threaded Barrel



L = 28, Dia = M6

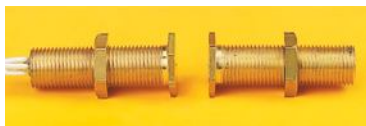
- Brass - nickel plated body
- Threaded barrel housings for easy fitting and adjustment
- Robust sealed construction ideal for harsh environments
- High switching capacity - up to 60VA and 120VA
- Suitable for a wide range of position sensing applications

Contact	150 mΩ
Switching Voltage	130 Vac
Current Rating	0.25A
Switching Power	3 VA
	Operating temperature
	Switching Distance
	3 mm

249448

Mfrs. List No.	Order Code	1+	5+	10+
Switch	PTC130/30	422-9083	8.98	8.63
Magnet	PRM	607-230	0.81	0.70

Reed, Threaded Barrel



L=28mm; Dia. thread=M8; Head Hex=11mm A/F



- Threaded barrel housings for easy fitting and adjustment
- High switching capacity - up to 120VA
- Suitable for a wide range of position, proximity and limit sensing applications
- Low cost CTI version for easy fitting
- Contacts closed with magnet position
- Good protection in harsh environments up to IP65

Applications

- Process control systems
- Intruder alarm, limit and proximity applications

Barrel size	M8 (coarse)	Contact resistance, max.	200mΩ
Contacts	SPNO (form A)	Switching distance, min	10 mm
Switching voltage, max.	230Vac	Operating temperature	-20°C to 85°C
Switching current, max.	0.5A	Case material	Brass
Switching capacity, resistive	10VA max.		

212400

Mfrs. List No.	Order Code	1+	Price Each	200+
CTI 302.	309-4820	5.89	4.45	3.47
CTI302M	309-4832	2.28	1.76	1.41

Reed, Metal Housing



Switch: 32x15x8
Actuator: 32x15x8
Fixing centres=20,
Fixing hole, 3.3 dia. csk

- Magnetic proximity switch with hermetically sealed contacts
- Suitable for position, level sensing and security/anti-tamper
- Contacts closed with magnet present
- Compact aluminium housing
- Good protection in harsh environments up to IP65

Applications:

- Process control systems
- Intruder alarm, limit and proximity applications

Switch contact operates when the magnet actuator moves in close proximity to the switch, typically 10mm.

Contacts	SPNO (form A)	Switching distance, min	10 mm
Switching voltage, max.	230Vac	Operating temperature	-20°C to 70°C
Switching current, max.	0.5A	Case material	Aluminium
Switching capacity, resistive	10VA	Cable length	280mm, PVC insulated
Contact resistance, max.	300mΩ		

212401

Mfrs. List No.	Order Code	1+	Price Each	200+
CTC 012.	309-4868	4.44	3.44	2.76
CTCM	309-4870	2.04	1.55	1.24

Reed, Metal Housing



Standard	Miniature
Standard switch: 79.5 x 19.3 x 9.8,	Fixing centres=50 (slots 14 x 4.7)
Standard actuator: 38.1 x 25.4 x 9.8,	Fixing centres=28 (slots 14 x 4.7)
Miniature switch: 38.3 x 12.7 x 7.7,	Fixing centres=25 (hole dia 3.1)
Miniature actuator: 38.3 x 12.7 x 7.7,	Fixing centres=25 (hole dia 3.1)

- Magnetically operated reed proximity switches encapsulated in pressure die castings with a blue powder coated finish
- Solid construction gives protection in harsh environments, IP64 rating
- Suitable for many applications with resistive loads
- Intruder alarm and limit switch, micro-switch and proximity switch applications
- Normally open or changeover contacts available

Connection is by integral PVC cable, 0.5m for miniature and 0.7m length for standard switches.

Size	Contact Form (earthed*)	Max dc Contact Ratings	Order Code
Switches		V	V.A.
Miniature	SPNO	220	15
Miniature	SPCO	175	3
Standard	SPNO*	250	100
Standard	SPCO*	250	50
			1.5
Order Code	Used with	Distance - face to face	Max. (mm)
170-840	170-838	7	13
	170-839	5	13
170-843	170-842	13	22
	170-841	13	25

Proximity Switches - Magnetic - continued

Reed, Metal Housing - continued

Type	Order Code	1+	10+	25+
Switches				
Miniature SPNO	170-838	7.57	6.23	5.65
Miniature SPCO	170-839	12.14	10.12	9.17
Standard SPNO	170-842	9.98	8.91	8.49
Standard SPCO	170-841	13.41	11.99	11.44
Magnets				
Miniature	170-840	4.06	3.37	3.09
Standard	170-843	4.10	3.75	3.54

212445

55100 Series, Mini Flange Mount Hall Effect Sensor



- Cost effective
- Magnetically operated position sensor
- 3 wire (voltage output)
- Reverse/over voltage protection
- Digital, latching or programmable analogue types available
- Built in temperature compensation

Description	Supply Voltage	Output High Voltage	Output Low Voltage	Output Current	Switching Speed	Order Code
Analogue	4.5 - 5.5V dc	4.65V dc	0.35V dc	1.0mA (max)	2 kHz	
Programmable						
High	3.8 - 24V dc	4.65V dc	0.35V dc	10mA (max)	10 kHz	505-2592
Sensitivity						
Medium	3.8 - 24V dc	4.65V dc	0.35V dc	10mA (max)	10 kHz	505-2567
Sensitivity						505-2580

338048

Mfrs. List No.	Order Code	1+	10+	25+	50+	100+	250+
55100 AP 02 A	505-2592	6.58	5.61	5.06	4.30	3.13	2.83
55100 3H 02 A	505-2567	4.18	3.56	3.22	2.65	1.93	1.66
55100 3M 02 A	505-2580	4.18	3.56	3.22	2.65	1.93	1.66

55110 Series, LED Flange Mount Hall Effect Sensor



- Cost effective
- Magnetically operated position sensor
- 3 wire (voltage output)
- Reverse/over voltage protection
- Digital or latching types available
- Built in temperature compensation
- Integral LED indicator

Description	Supply Voltage	Output High Voltage	Output Low Voltage	Output Current	Switching Speed	Order Code
3 Wire						
High	3.8 - 24V dc	VDD-2 @ 0.1mA	0.4V dc @ 10mA (max)	10mA (max)	10 kHz	
Sensitivity		(sinking output with integral pull up)				505-2609
Medium	3.8 - 24V dc	VDD-2 @ 0.1mA	0.4V dc @ 10mA (max)	20mA (max)	10 kHz	
Sensitivity		(sinking output with integral pull up)				505-2622

338047

Mfrs. List No.	Order Code	1+	10+	25+	50+	100+	250+
55110 3H 02 A	505-2609	5.54	4.70	4.24	3.51	2.55	2.21
55110 3M 02 A	505-2622	5.24	4.44	4.02	3.43	2.48	2.26

Solid State - Long Range Sensing



M8: L=50 (cable type), 59 (plug-in type)
 M18: L=50 (cable type), 65 (plug-in type)
 Rectangular: H=16, W=10, D=28 (body)

Magnets:
 M3.0: Dia.=20, H=6.5, Hole dia.=4.3
 M5.0: Dia.=31, H=15, Hole dia.=5.3

- Can be installed flush and non-flush in metal
- Long sensing ranges, even with small size sensors
- Can be used to detect magnets behind surfaces such as wood, plastic or non-ferrous metal
- High switching frequency
- Short circuit and reverse polarity protection
- Barrel sensors in robust metal housings
- Plastic rectangular housing similar to V3 style microswitch
- Prewired 2m cable or plug-in connector options
- LED status indication
- IP67 enclosure rating
- Suitable magnets available, centre drilled and countersunk

Sensing range, axial (using M4.0 magnet)

In non-magnetisable material
 Flush in magnetisable material
 Operating voltage
 Switching output
 Case material
 Connection, plug-in
 Magnet material

M8=60, M18=70, Rectangular=60
 M8=20, M18=55, Rectangular=20
 10-30V dc
 PNP, normally open, 300mA max.
 M8/M18: brass, nickel plated; Rectangular: plastic
 M8/Rectangular: M8 screw lock; M18: M12
 Barium ferrite

SICK

Mfrs. List No. MM08-60APS-ZUO=722-9495,
 MM08-60APS-ZTO=722-9501,
 MM18-70APS-ZUO=722-9513,
 MM18-70APS-ZCO=722-9525,

MQ10-60APS-KUO=722-9537,
 M3.0=722-9550,
 M5.0=722-9562

FOR SUITABLE SENSOR CONNECTORS SEE ORDER CODE 131-7876.

221267

Proximity Switches	Connection	Order Code	1+	5+	10+
M8 barrel	Cable	722-9495	38.56	37.00	36.26
M8 barrel	Plug-in	722-9501	37.86	35.22	34.46
M18 barrel	Cable	722-9513	36.37	33.84	33.10
M18 barrel	Plug-in	722-9525	37.49	34.88	34.12
Rectangular	Cable	722-9537	38.56	37.00	36.26
Magnets					
Dia.=20, H=6.5 (drilled)		722-9550	3.60	3.46	3.40
Dia.=31, H=15 (drilled)		722-9562	6.31	6.06	5.94

Proximity Switches - Capacitive

OMRON

Low Profile, dc - E2K-F



- For detection of metallic or non-metallic objects
- Flat-pack construction allows a 10mm sensing range in a comparatively small space
- LED operation indicator fitted
- Protection to IP66

H=10.1, W=50 (overall), 34 (face), D=20, Fixing centres=42
 (3.5 dia.), Cable L=2m

A plastic body capacitive proximity switch. The switch can be mounted directly onto a metal panel, though care should be taken with regard to surrounding metal, since the switch is of non-shielded construction and is side sensitive.

Sensing distance	10mm (max.)	Current consumption	10mA max. @ 24V dc
Operating voltage	10 to 30V dc dc, 10% ripple (max.)	Response frequency	100Hz
Output	NPN	Temperature range	-10°C to +55°C

212192

Mfrs. List No.	Order Code	1+	5+	10+
E2KF10MC1	160-3020●	48.64	46.20	43.78

34mm ac and dc - E2K-C Series

OMRON



- Detects metallic or non-metallic objects without contact
- Sensitivity is adjustable by built-in potentiometer
- Output indication via LED
- Protection IP66
- DC types have UL listing
- Supplied with mounting bracket

Note: When mounting with bracket, provide 20mm (min) between face of detecting head and bracket.

Sensing distance	3 to 25mm (adjustable)	Response frequency	
Output		dc type	70Hz
Current consumption	1 to 2 mA (ac) 10 to 15mA (dc)	ac type	10Hz
Output mode	Normally Open	Temperature range	-25°C to +70°C

212447

Voltage	Mfrs. List No.	Order Code	1+	5+	10+
10 to 40V dc/NPN	E2KC25ME1	160-3034●	96.90	92.06	87.22
10 to 40V dc/PNP	E2KC25MF1	160-3037●	96.90	92.06	87.22
90 to 250V ac/SCR	E2KC25MY1	160-3035●	96.90	92.06	87.22

Low Profile, DC - CBN Series

PEPPERL+FUCHS



Low Cost Level Solution



H=50, W=20 D=5

- Low profile capacitance sensors in extremely compact PBT body
- Direct Mounting on metal surfaces
- Can be mounted together in direct proximity, enables positions, speeds and motions to be determined
- Can 'see' through non-conducting materials (e.g. thin wood panels and tubes)
- Non-embeddable 5 mm sensing range
- 3 wire normally open NPN and PNP output options
- Short circuit and Polarity reversal protected
- Protection to IP67

Supply Voltage 10 to 30Vdc
Connection 2m PVC cable
Operating Current 0 to 100mA

Switching Frequency 10Hz
Temperature range -25°C to 70°C

233748

Sensing Distance	Output	Mfrs. List No.	Order Code	1+	5+	10+	25+
5mm	NPN	CBN5-F46-E0	372-6113	47.45	46.03	45.08	44.13
5mm	PNP	CBN5-F46-E2	372-6125	47.45	46.03	45.08	44.13

Proximity Sensor

Capacitive DC



Supply voltage
Operating distance - M18 Types
Operating distance - M30 Types
Temperature range
Protection

Capacitive proximity sensors produce an electric field with which they detect electrically conducting or non-conducting materials, solids particles or liquids, without making contact. Target detection is not affected by colour. The sensors feature adjustable sensitivity allowing them to be set-up to differentiate between materials or compensate for varying mounting conditions. The output state is user selectable as either Normally Open or Normally Closed.

proxistor.
New

7 to 30V dc
10mm ±10%
20mm ±10%
-25°C to +80°C
IP 67

505570

Output ConnectionType	Mfrs. List No.	Order Code	1+	5+	10+	25+
M18 Threaded						
PVC Lead PNP	CPU010VCSN	156-5064	48.46	46.04	43.62	40.40
PVC Lead NPN	CNU010VCSN	156-5065	48.46	46.04	43.62	40.40
M12 Plug PNP	CPU010VCTN	156-5067	48.46	46.04	43.62	40.40
M12 Plug NPN	CNU010VCTN	156-5068	48.46	46.04	43.62	40.40
M30 Threaded						
PVC Lead PNP	CPU020VDSN	156-5069	51.48	48.90	46.33	42.90
PVC Lead NPN	CNU020VDSN	156-5070	51.48	48.90	46.33	42.90
M12 Plug PNP	CPU020VDTN	156-5071	51.48	48.90	46.33	42.90
M12 Plug NPN	CNU020VDTN	156-5073	51.48	48.90	46.33	42.90

M18 and M30 AC/DC - CJ Series

PEPPERL+FUCHS



Thread M18 x 1, L=79

- Cylindrical Embeddable Capacitance sensors 8 and 10 mm adjustable range
- Normally open NPN and PNP, and AC output options
- Connection type; 2m PVC cable
- Short circuit and Polarity reversal protected
- Housing material PBT and high grade steel

Outputs	Operating voltage	Operating current	Switching frequency	IP rating
PNP, NPN/NO	10 to 30Vdc	0 to 300mA	100Hz	IP67
PNP, NPN/NO+NC	10 to 60Vdc	0 to 200mA	1Hz	IP65
AC	20 to 253Vac	5 to 200mA	10Hz	IP67

233750

Sensing Range	Output	Mfrs. List No.	Order Code	1+	5+	10+	25+
M18, Steel Body							
8mm	NPN/NO	CJ8-18GM-E0	372-6137	66.17	64.18	62.86	61.53
8mm	PNP/NO	CJ8-18GM-E2	372-6149	66.17	64.18	62.86	61.53
M30, Steel Body							
10mm	AC/NO	CJ10-30GM-WS	372-6198	121.24	117.60	115.17	112.75
M30, Plastic Body							
10mm	AC/NC	CJ10-30GK-W0	372-6186	124.63	120.89	118.39	115.91

Flat Pack, dc - EC55

Prewired



H=35, W=55, D=15, Fixing Centres=25 (Slot W=3.5)

Sensing distance 5 to 25mm
Operating voltage 10 - 40V dc
Switching current ≤200mA
Frequency of operation 100Hz

Operating temperature -25°C to +70°C
Housing material Grey polycarbonate
Cable material Grey PUR, 2m

222160



Mfrs. List No.	Order Code	1+	5+	10+
Prewired, NPN EC 55 25 NPAP	711-4941	58.96	56.01	54.88
Prewired, PNP EC 55 25 PPAP	711-4953	58.96	56.01	54.88

M30 ac/dc, Extended Sensing - 'Tripleshield'

Prewired and M12 Plug-in



L=72.6 (non-flush), 60.6 (flush), Thread=M30

- Outstanding high immunity against ESD, interference and transients, exceeding all industry norm requirements
- Adjustable extended sensing distances to 25mm
- Elevated temperature range -25°C to +80°C
- DC types available NPN or PNP with NO/NC dual output
- AC types have SCR output with programmable NO/NC switching
- DC types have reverse polarity and short-circuit protection
- Senses most materials
- IP67 protection

M30 sensors in thermoplastic polyester housing, triple protected against environmental disturbances, fitted with 2m PUR cable or M12 connector.

Output functions

dc types (4-wire): NO/NC, wire selectable
ac types (2-wire): NO/NC, switch selectable
Flush=2 to 16mm, Non-flush=4 to 25mm
≤500mA (ac types), ≤200mA (dc types)
25Hz (ac types), 100Hz (dc types)

Sensing distance

Rated operating current (continuous)

Operating frequency

Operating voltage	Output type	Mounting style	Mfrs. List No.	Order Code	Mfrs. List No.	Order Code
10-40V dc	NPN	Non-flush	EC 30 25 NPAPL	711-3201	EC3025 NPAPL-1	721-2999
10-40V dc	PNP	Non-flush	EC 30 25 PPAPL	711-3213	EC3025 PPAPL-1	721-3001
20-250V ac	Thyristor	Non-flush	EC 30 25 TBAPL	711-3249	EC3025 TBAPL-6	721-3025
10-40V dc	NPN	Flush	EC 30 16 NPAPL	711-3225	EC3016 NPAPL-1	721-2975
10-40V dc	PNP	Flush	EC 30 16 PPAPL	711-3237	EC3016 PPAPL-1	721-2987

222156

Voltage	Output	Order Code	1+	5+	10+	25+
Prewired, Non-flush Mounting						
10 to 40V dc	NPN	711-3201	53.93	51.22	50.19	47.11
10 to 40V dc	PNP	711-3213	53.93	51.22	50.19	47.11
20 to 250V ac	Thyristor	711-3249	71.84	68.25	66.90	62.76
Prewired, Flush Mounting						
10 to 40V dc	NPN	711-3225	60.38	57.35	56.20	52.75
10 to 40V dc	PNP	711-3237	60.38	57.35	56.20	52.75
20 to 250V ac	Thyristor	711-3250	75.32	71.56	70.12	65.82
Plug-in, Non-flush Mounting						
10 to 40V dc	PNP	721-3001	60.91	57.86	56.72	53.22
20 to 250V ac	Thyristor	721-3025	73.93	70.23	68.83	64.60

Proximity Switches - Inductive - Pepperl + Fuchs

PEPPERL+FUCHS

Prewired and Plug-in, ac and dc
2 and 3 wire



- 3 wire normally open NPN and PNP output options.
- 2 wire normally open AC output options
- Protection Degree IP67
- Yellow LED indicator
- Short circuit/overload protected
- Cable connector versions
- Sensing range 1.5 to 15mm

Temperature range -25° to 70°C

Type	Operating Voltage	Current (mA)	Response Frequency (Hz)
NBB 1.5	10 to 30Vdc	100	1500
NBB2	10 to 30Vdc	200	1500
NBB5	10 to 30Vdc	200	800
NBB10	10 to 30Vdc	200	200
NBN2	10 to 30Vdc	100	1500
NBN4	10 to 30Vdc	200	1200
NBN8	10 to 30Vdc	200	500
NBB,NBN...WS	20 to 253Vac	5 to 200	20

Nomenclature

NJ Inductive, Initiator
NBB Inductive, base line, embeddable
NBN Inductive, base line, non-embeddable
1.5 Sensing range mm
8 Housing size (8mm diameter)
GM Metal thread
50 Housing length mm

Nomenclature

E0 NPN normally open
E2 PNP normally open
WS Normally open ac
V1 M12 connector (cable version)
2m PVC no reference)
V3 M8 connector 3 pin

Sensing Distance mm	Mfrs. List No.	Order Code	1+	10+	25+	50+	100+
Prewired 3 wire dc, 2 wire ac-embeddable and non embeddable							
Embeddable							
1.5	NBB1,5-8GM50-E0	356-5154	34.05	33.03	32.36	31.67	30.61
1.5	NBB1,5-8GM50-E2	356-5166	37.83	36.70	35.95	35.19	34.01
2	NBB2-12GM50-E0	356-5178	26.21	25.43	24.91	24.39	23.56
2	NBB2-12GM50-E2	356-5180	26.95	26.14	25.60	25.07	24.23
5	NBB5-18GM50-E0	356-5191	32.78	31.80	31.14	30.48	29.47
5	NBB5-18GM50-E2	356-5208	32.78	31.80	31.14	30.48	29.47

Proximity Switches - Inductive - Pepperl + Fuchs - continued

Prewired and Plug-in, ac and dc - continued

2 and 3 wire - continued

Prewired 3 wire dc, 2 wire ac-embeddable and non embeddable									
Sensing Distance mm	Mfrs. List No.	Order Code	1+	10+	Price Each				
					25+	50+	100+		
Non-Embeddable									
2	NBN2-8GM50-E0	356-5233	36.80	35.70	34.97	34.23	33.08		
4	NBN4-12GM50-E0	356-5257	26.95	26.14	25.60	25.07	24.23		
4	NBN4-12GM50-E2	356-5269	26.95	26.14	25.60	25.07	24.23		
8	NBN8-18GM50-E0	356-5270	31.89	30.94	30.29	29.65	28.66		
8	NBN8-18GM50-E2	356-5282	31.89	30.94	30.29	29.65	28.66		
Embeddable, NO AC									
8	NJ2-12GM50-WS	356-5350	61.54	59.83	58.22	56.69	55.23		
5	NBB5-18GM60-WS	356-5361	54.05	52.54	51.12	49.78	48.50		
5	NBB10-30GM50-WS	356-5373	49.20	47.72	46.74	45.75	44.21		
Non-Embeddable, NO AC									
8	NBN8-18GM60-WS	356-5397	54.30	52.67	51.59	50.50	48.81		

233687

M8 and M12, 3 Wire dc, embeddable and non-embeddable					Price Each				
Sensing Distance (mm)	Mfrs. List No.	Order Code	1+	10+	25+	50+	100+		
Embeddable + M8 Connector									
1.5	NBB1.5-8GM50-E0-V3	356-5415	36.66	35.56	34.83	34.10	32.95		
1.5	NBB1.5-8GM40-E2-V3	356-5427	35.66	34.59	33.88	33.17	32.05		
Non-Embeddable + M8 Connector									
2	NBN2-8GM50-E2-V3	356-5520	35.66	34.59	33.88	33.17	32.05		
Embeddable + M12 Connector									
1.5	NBB1.5-8GM40-E0-V1	356-5439	35.66	34.59	33.88	33.17	32.05		
1.5	NBB1.5-8GM40-E2-V1	356-5440	36.66	35.56	34.83	34.10	32.95		
2	NBB2-12GM50-E0-V1	532-710	23.33	22.69	22.10	21.53	--		
2	NBB2-12GM50-E2-V1	532-721	25.70	24.94	24.42	23.91	--		
5	NBB5-18GM50-E0-V1	356-5476	30.85	29.93	29.31	28.68	27.72		
5	NBB5-18GM50-E2-V1	532-745	31.71	30.76	30.12	29.49	--		
Non-Embeddable + M12 Connector									
4	NBN4-12GM50-E2-V1	356-5567	25.79	25.02	24.49	23.98	23.17		

Turn to page 583 for **Sensor Leads**Extended Range, Prewired and Plug-in **PEPPERL+FUCHS**
3 wire dc, Embeddable

- Yellow LED indicator
- Short circuit/overload protected
- Cable connector versions
- Sensing range 1.5 to 15mm
- 3 wire normally open NPN and PNP output options.
- Protection Degree **IP67**

Temperature range -25° to 70°C
Supply Voltage 10 to 30Vdc
Response Frequency ≥300Hz
Output rating 100mA

233701

Sensing Distance (mm)	Output	Thread Size	Mfrs. List No.	Order Code	1+	Price Each			25+
Embeddable-Prewired									
4	NPN	M12	NBB4-12GM50-E0	372-5844	34.80	32.04	30.99	29.97	
4	PNP	M12	800734	372-5856	35.78	32.93	31.84	30.79	
8	NPN	M18	NBB8-18GM50-E0	372-5868	42.98	41.70	40.84	39.97	
8	PNP	M18	NBB8-18GM50-E2	372-5870	44.19	42.87	41.98	41.10	
Embeddable-Plug in, M12									
4	NPN	M12	NBB4-12GM50-E0-V1	372-5900	35.24	33.48	32.76	31.71	
4	PNP	M12	NBB4-12GM50-E2-V1	372-5911	37.51	35.27	33.42	31.56	
8	NPN	M18	NBB8-18GM50-E0-V1	372-5923	33.42	32.41	31.74	31.07	
8	PNP	M18	NBB8-18GM50-E2-V1	372-5935	43.28	42.04	40.87	38.84	

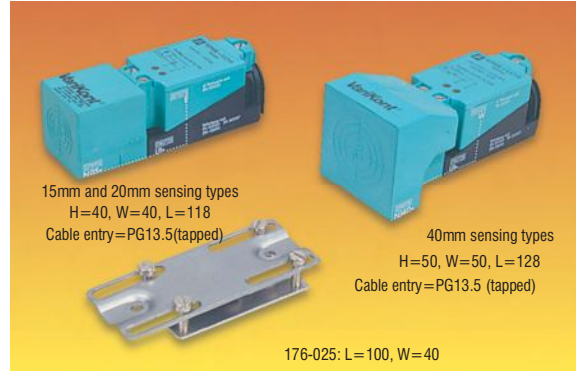
2 Wire dc, prewired
Embeddable and Non Embeddable

Temperature range -25° to 70°C
Supply Voltage 6 to 60Vdc
Response Frequency 1000Hz (NBN8), 1500 Hz (NBB5), 2000Hz (NBB2, NBN4)
Output rating 4 to 100mA
Off state current 1mA

- Low Off-state current -2 wire Inductive sensors
- 2 wire dc NO output with yellow LED operation indicator
- Reverse polarity tolerant
- Fully shielded
- Protection Degree **IP67**

233702

Sensing Distance (mm)	Thread Size	Mfrs. List No.	Order Code	1+	10+	Price Each		
						25+	50+	100+
2 Wired dc, Embeddable-Prewired, 2m								
2	M12	NBB2-12GM40-Z0	356-5312	26.95	26.14	25.60	25.07	24.23
5	M18	NBB5-18GM40-Z0	356-5324	31.89	30.94	30.29	29.65	28.66
2 Wired dc, None-Embeddable-Prewired, 2m								
4	M12	NBN4-12GM40-Z0	372-5741	26.95	26.14	25.60	25.07	24.23
8	M18	NBN8-18GM40-Z0	356-5348	23.60	22.90	22.42	21.94	21.22

5 Position Turret Head Range -
2 Wire ac, 3 Wire dc**PEPPERL+FUCHS**

- Sensing head may be set in one of 5 positions mutually at right angles
- Main body of unit plugs into base and may therefore be replaced easily
- Key-way pin prevents connection of a dc unit into an ac base
- LED indication of operation and supply (dc versions)
- Connection is to terminals within the base of the unit
- 15mm types are flush mountable
- Conforms to **DIN43694**, **EN50025** and **EN50037**
- All bases now supplied with metric sleeves

Output ac: NO or NC, dc: NO
Output rating ac: 500mA 45 to 65Hz (2-wire thyristor)
dc: 200mA (3-wire NPN or PNP transistor)
Response frequency ac: 25Hz, dc: 300Hz
Temperature range -25°C to +70°C

Inductive proximity switches for detection of metallic objects without physical contact at a distance dependent on the ferrous content within the object. The indicated sensing distances are based upon ferrous material.

The switch mounting bracket is a two part kit to allow easy mounting and setting of the above switches. It gives 30mm lengthwise adjustment.

Mfrs. List Nos: NJ15+U1+W=176-021 NJ20+U1+E2=179-264 NJ40+U1+E2=179-265
NJ15+U1+E2=179-262 NJ40+U1+W=176-023 MH4-2057=176-025
NJ20-U1-W=254-435

212456

Sensing Distance	Voltage	Order Code	1+	Price Each			
				5+	10+	25+	
15mm	20 to 250V ac	176-021	92.37	89.60	87.75	85.90	
15mm	10 to 30V dc/PNP	179-262	45.58	41.94	38.60	35.52	
20mm	20 to 250V ac	254-435	92.37	89.60	87.75	85.90	
20mm	10 to 30V dc/PNP	179-264	45.58	43.16	42.02	40.95	
40mm	20 to 250V ac	176-023	92.52	89.75	87.90	86.05	
40mm	10 to 30V dc/PNP	179-265	44.94	43.59	42.69	41.79	
Switch mounting bracket		176-025	4.10	3.98	3.90	3.82	

Mounting Clamp, M18

PEPPERL+FUCHS

Surface mount clamp offering an alternative method of mounting standard M18 cylindrical proximity switches. Slots allow lengthwise adjustment.

212458

Size	Order Code	1+	Price Each	
			10+	25+
M18	179-309	3.65	3.54	3.47

Miniature V3 Style Sensors

PEPPERL+FUCHS

- 3 wire dc with yellow LED operation indicator
- Fully Shielded
- Miniature V3 style housing
- Prewired 100mm
- NPN or PNP normally open outputs
- Housing protected to IP67

Switching Frequency 1000Hz
Output Rating 100mA
Temperature Range -25°C to 70°C

NBB2-V3-E0 372-5753 NBB2-V3-E2 372-5765 233706

Prewired 3 wire dc, 2 wire ac-embeddable and non embeddable							
Sensing Distance (mm)	Voltage	Order Code	1+	5+	10+	25+	50+
Prewired							
2	10 to 30Vdc/NPN	372-5753	25.52	24.79	24.10	23.45	22.83
2	10 to 30Vdc/PNP	372-5765	24.18	23.45	22.97	22.49	21.74

Proximity Sensor Output Interface Terminals



- Miniature amplifier for NAMUR sensors (see Hazardous Area Equipment Section) and DC Sensors
- 20mm wide module for 35mm din rail mounting
- Lead break monitoring (L versions)
- Short circuit protected
- Yellow LED output indicator
- Self opening instrument terminals, conductor 2,5 mm²
- Provides 8Vdc to Namur sensor
- Relay output for DC Sensors

Supply Voltage 10 to 30Vdc
Switching Frequency 1000Hz
Output Rating NPN/PNP = 200mA, Relay = 2A
Temperature Range -25°C to 70°C

233710

Prewired 3 wire dc, 2 wire ac-embeddable and non embeddable							
Sensor Type	Voltage	Order Code	1+	5+	10+	50+	
Prewired							
Namur	10 to 30Vdc/NPN/NO	372-6022	20.04	19.45	19.05	18.02	
Namur(L)	10 to 30Vdc/PNP/NO	372-6060	22.41	21.73	21.29	20.14	

Proximity Switches - Inductive - Omron

Miniature, 3-Wire dc - TLW Series



- Side mounted LED indicates output on
- Reverse polarity protected
- Protection to IP67
- Prewired with 2m cable
- ABS body ideal for chemical plant and food processing applications

A miniature inductive proximity switch of flat construction and side sensing. Cable entry is perpendicular to the sensing direction.

160-3082 & 179-258 H=27, W=10, D=5.5 fitted with mtg bracket
160-3081 & 177-886 H=30.5, W=18, D=10

Output	Normally Open	Output rating	3mm	100mA			
Sensing distance	3mm, 5mm		5mm	50mA at 12V dc, 100mA at 24V dc	-25°C to +70°C		
Operating voltage	10 to 30V dc, 10% ripple	Operating temperature					
Mfrs. List No:	Order Code	Mfrs. List No:	Order Code				
TLW3MC1	160-3082	TLW5MC1	160-3081				
TL-W3MB1	179-258	TLW5MB12M0MC	177-886				212450

Sensing Distance	Output	Order Code	1+	5+	10+
3mm	NPN	160-3082●	28.78	27.03	26.09
3mm	PNP	179-258●	33.56	31.88	30.30
5mm	NPN	160-3081●	26.16	24.57	23.71
5mm	PNP	177-886●	33.09	30.30	27.59

High Performance E2A Series



- Improved sensing range increasing reliability
- Long sensing range aiding mechanical protection
- IP67 for environmental protection
- Rugged construction and improved cable protection
- Clear, visible indicator of operation

Control Output PNP or NPN Open collector, load current 200mA max.
Operation mode NO for all types
Power Supply 12 to 24V dc
Enclosure rating IP67
Response frequency M12 - 1kHz, M18 - 500Hz, M30 - 250Hz
Temperature range -40°C to +70°C

Sensing Distance	Thread Size	Thread Length	Overall Length	Output	Mfrs. List No.	Order Code
Pre-wired						
4mm	M12	34	50	PNP	E2AM12KS04WPB12M	160-3083
4mm	M12	34	50	NPN	E2AM12KS04WPC12M	160-3084
8mm	M18	39	59	NPN	E2AM18KS08WPC12M	160-3088
15mm	M30	44	64	PNP	E2AM30KS15WPB12M	160-3091

M12 Connector							
4mm	M12	34	48	PNP	E2AM12KS04M1B1	160-3086	
4mm	M12	34	48	NPN	E2AM12KS04M1C1	160-3087	
8mm	M18	39	53	PNP	E2AM18KS08M1B1	160-3089	
15mm	M30	44	58	PNP	E2AM30KS15M1B1	160-3092	337918

Size	Sensing Distance	Output	Order Code	1+	5+	10+
Prewired						
M12	4mm	PNP	160-3083●	23.42	22.01	21.23
M12	4mm	NPN	160-3084●	23.42	22.01	21.23
M18	8mm	NPN	160-3088●	24.26	22.80	22.00
M30	15mm	PNP	160-3091●	28.50	26.79	25.84
M12 Connector						
M12	4mm	PNP	160-3086●	24.60	23.11	22.30
M12	4mm	NPN	160-3087●	24.60	23.11	22.30
M18	8mm	PNP	160-3089●	24.60	23.11	22.30
M30	15mm	PNP	160-3092●	30.20	28.38	27.39

Prewired Range - 3-Wire dc, 2-Wire ac and dc E2E Series



M12 shielded M18 unshielded

- Choice of shielded or non-shielded construction
- Non-shielded types offer longer sensing distances
- All dc 3-wire types are protected against reverse polarity connection
- All dc 3-wire types offer overload/short-circuit protection
- 2-wire ac and dc types are particularly suitable for PLC connection
- All types feature LED operation indicator
- Standard length of wire is 30cm
- DC types are UL approved

DIN inductive proximity switches for detection of metallic objects without physical contact at a distance dependent upon ferrous content within object. The indicated sensing distances are based upon ferrous material.

DC 3-wire types include NPN and PNP outputs and shielded or non-shielded construction. Non-shielded types offer longer sensing distances than shielded, but are side sensitive and hence may mutually interfere.

2-wire ac and dc types are particularly suitable for PLC connection, since they will take their supply directly from the PLC and their very low leakage current will not cause the PLC input to turn on when the proximity switches are in the off state.

Supply voltage	3-wire dc 12 to 24V dc 2-wire dc 12 to 24V dc 2-wire ac to V ac
Output	Normally open, NPN or PNP
Output rating	2-wire dc 100mA, 3-wire dc 200mA, 2-wire ac 200mA
Sealing	IP67
Response times dc	1mm 0.1ms, 2mm 1ms, 5/10mm 5ms, ac: 5/10mm 0.10ms
Operating temperature	-40°C to +85°C (3-wire dc and ac), -25°C to +70°C (2-wire dc)

Sensing Distance	Thread Size	Thread Length	Overall Length	Output	Mfrs. List No.	Order Code
3-wire dc, shielded						
1mm	M8	26	30	NPN	E2EX1R5E1	160-3038
1mm	M8	26	30	PNP	E2EX1R5F1	160-3045
2mm	M12	33	38	NPN	E2EX2E1	160-3039
2mm	M12	33	38	PNP	E2EX2F1	160-3043
5mm	M18	38	43	NPN	E2EX5E1	160-3040
5mm	M18	38	43	PNP	E2EX5F1	160-3044
3-wire dc, unshielded						
5mm	M12	26	38	NPN	E2EX5ME1	160-3046
5mm	M12	26	38	PNP	E2EX5MF1	160-3049
2-wire dc, shielded						
3mm	M12	33	38	—	E2E-X3D1	160-3051
7mm	M18	38	43	—	E2E-X7D1	160-3052
2-wire ac, shielded						
5mm	M18	38	43	—	E2EX5Y1	160-3041
10mm	M30	43	48	—	E2EX10Y1	160-3042

212453

Size	Sensing Distance	Output	Order Code	1+	5+	10+
3-wire dc, shielded						
M8	1mm	NPN	160-3038●	53.92	49.60	45.29
M8	1mm	PNP	160-3045●	53.92	49.60	45.29
M12	2mm	NPN	160-3039●	54.70	50.31	45.94
M12	2mm	PNP	160-3043●	53.89	49.57	45.26
M18	5mm	NPN	160-3040●	54.70	50.31	45.94
M18	5mm	PNP	160-3044●	54.70	50.31	45.94
3-wire dc, unshielded						
M12	5mm	NPN	160-3046●	54.70	50.31	45.94
M12	5mm	PNP	160-3049●	54.70	50.31	45.94
2-wire dc, shielded						
M12	3mm	—	160-3051●	49.80	45.82	41.83
M18	7mm	—	160-3052●	58.32	53.65	48.98
2-wire ac, shielded						
M18	5mm	—	160-3041●	82.10	75.54	68.96
M30	10mm	—	160-3042●	84.95	78.16	71.36

Over 480,000 products online



Proximity Switches - Inductive - Omron - continued

Square, 2 Wire ac - TL-YS

OMRON



- Two-wire supply 90 to 250V ac
 - Reverse polarity protection
 - Red LED operation indicator
 - Screw terminal connections
- Sensing distance 15mm
Supply voltage 90 to 250V ac
Output rating (normally open) 500mA
Sealing IP66
Response frequency 20Hz
Temperature range -25°C to +70°C
H=40, W=40, D=114

212206

Mfrs. List No.	Order Code	1+	5+	10+
TL-YS15-MY1	176-402	65.39	60.97	55.55

Proximity Switches - Inductive - Telemecanique

Osiprox
Pre-cabled Universal Proximity Switch - IP67
M8

Telemecanique



- Extended Sensing range
 - 2X nominal sensing distance
 - Flush mountable in metal
 - Fast switching frequency
- Nominal sensing distance 2.5mm
Output PNP N/O
Contact rating 10 - 36V dc
Switching Capacity 200mA
Max. switching frequency 2500 Hz
Operating temperature -25°C to 70°C
Protection IP67

dia.=M8, L=50

246768

Mfrs. List No.	Order Code	1+	5+	10+
XS608B1PAL2	425-4697	36.60	34.05	33.32

Osiprox Universal Proximity Switches
- IP67 M12

Telemecanique



- Extended Sensing range
 - 2X nominal sensing distance
 - Flush mountable in metal
 - Fast switching frequency
- Nominal sensing distance 4mm
Output PNP N/O
Contact rating 10 - 36V dc
Switching Capacity 200mA
Max. switching frequency 2500 Hz
Operating temperature -25°C to 70°C
Protection IP67

dia=M12, L=50

246769

Description	Mfrs. List No.	Order Code	1+	5+	10+
Metal Body					
Pre-cabled 3 wire dc	XS612B1PAL2	425-4715	33.27	30.95	30.28
M12 Connector 3 wire dc	XS612B1PAM12	425-4727	34.61	32.19	31.54

Osiprox
Universal Proximity Switches - IP67
M18

Telemecanique



- Extended Sensing range
 - 2X nominal sensing distance
 - Flush mountable in metal
 - Fast switching frequency
- Nominal sensing distance 8mm
Output PNP N/O
Contact rating 10 - 36V dc
Switching Capacity 200mA
Max. switching frequency 1 kHz
Operating temperature -25°C to 70°C
Protection IP67

dia.=M18, L=60

246770

Description	Mfrs. List No.	Order Code	1+	5+	10+
Metal Body					
Pre-cabled 3 wire dc	XS618B1PAL2	425-4739	33.27	30.95	30.28
M18 Connector 3 wire dc	XS618B1PAM12	425-4740	33.27	30.95	30.28
Pre-cabled 2 wire ac/dc	XS608B1PAL2	425-4790	46.57	34.05	33.32
M18 Connector 2 wire ac/dc	XS618B1MAU20	425-4806	46.57	43.32	42.39

Osiprox
Universal Proximity Switches - IP67
M30

Telemecanique



- Extended Sensing range
 - 2X nominal sensing distance
 - Flush mountable in metal
 - Fast switching frequency
- Nominal sensing distance 15mm
Output PNP N/O
Contact rating 20 - 264V ac/dc
Switching Capacity 200mA
Max. switching frequency 500 Hz
Operating temperature -25°C to 70°C
Protection IP67

dia.=30, L=60

246771

Description	Mfrs. List No.	Order Code	1+	5+	10+
Metal Body					
Pre-cabled 3 wire dc	XS630B1PAL2	425-4752	36.60	34.05	33.31
Pre-cabled 2 wire ac/dc	XS630B1MAL2	425-4818	51.24	47.65	46.63

Extended Sensing, Rewired
Short Case, 3 Wire dc

Telemecanique



- 3-wire dc inductive proximity switches with extended sensing range
- Multi-direction LED operation indication
- Fully shielded
- Over-load and short-circuit protection

530-293: Thread M8, L=33
530-300: Thread M12, L=33
530-311: Thread M18, L=33.5

Output	Normally Open, PNP	Response frequency	M8=350Hz M12=300Hz M18=60Hz
Output rating	200mA		
Supply voltage	12 to 24V dc	Temperature range	-25°C to +50°C
Voltage limits (incl. ripple)	10 to 38V dc		
Sealing	IP67		

212175

Size	Sensing Distance	Mfrs. List No.	Order Code	1+	5+	10+	25+
M8	2mm	XS1N08PA349	530-293	31.47	29.30	28.66	28.03
M12	3.2mm	XS1N12PA349	530-300	28.86	26.86	26.30	25.75
M18	8mm	XS1N18PA349	530-311	31.11	28.98	28.35	27.72

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Extended Sensing, M8 and M12 Plug-In



3-Wire dc, Short Case



- 3-wire dc inductive proximity switches with extended sensing range
- Red LED operation indicators giving multi-direction visibility
- Fully shielded
- Over-load and short-circuit protection
- Metal body incorporates a metal 3-pin screw-lock M8 or 4-pin M12 plug-in connector

Output	Normally Open, PNP	Response frequency	M8=350Hz
Output rating	200mA		M12=300Hz
Supply voltage	12 to 24V dc		M18=60Hz
Voltage limits (incl. ripple)	10 to 38V dc	Temperature range	-25°C to +50°C
Sealing	IP67		
Sensing Distance	Thread Size	Plug Connection	Output
2mm	M8x42	M8	PNP
2mm	M8x45	M8	PNP
3.2mm	M12x45	M12	PNP
8mm	M18x45	M18	PNP
			Mfrs. List No.
			Order Code
			530-323
			530-335
			530-347
			530-359

FOR SUITABLE M8 SENSOR CONNECTORS SEE ORDER CODE 131-7876
FOR SUITABLE M12 SENSOR CONNECTORS SEE ORDER CODE 532-010

222138

Plug-in Connection Size	Sensing Distance	Output	Order Code	1+	5+	10+	25+
M8	2mm	PNP	530-323	37.38	34.79	34.05	33.33
M8	2mm	PNP	530-335	36.32	33.80	33.08	32.37
M12	3.2mm	PNP	530-347	28.86	26.86	26.30	25.75
M18	8mm	PNP	530-359	31.11	28.98	28.35	27.72

Proximity Switches - Inductive - Balluff

Miniature Inductive Proximity Sensors



XS Series - Extended Range



A complete family of miniature sensors available with extended sensing range for applications where space is at a premium. With small size and low weight the XS range is designed for sensing applications such as automatic handling systems, special assembly machines and robot grippers. The extended sensing range assures that

even with such diminutive housings a useful sensing distance can be achieved - even with the smallest 3mm housing has a sensing range of 1 mm.

- Unique sensing ranges for size of sensor
- Smooth cylindrical housings
- Stainless steel housings
- Short circuit and polarity reversal protected
- LED for visual indication of output state
- Supplied with 3 wire connecting lead
- 24V dc operating voltage
- Operating temperature up to 70°C
- IP67 rated for arduous environments

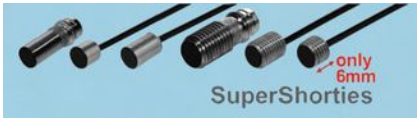
515368

Dia. (mm)	Sense Dist.	Output Type	Mfrs. Config. List No.	Order Code	1+	5+	10+
3	1mm	PNP	NO	BES 516-3044-G-E4C-PU05	161-2824	65.05	61.95
3	3mm	PNP	NO	BES 516-3048-G-E4-C-05	161-2825	100.79	95.99
4	5mm	PNP	NO	BES G04ED-PSC50F-EP05	161-2826	100.79	95.99
4	5mm	PNP	NC	BES G04ED-POC50F-EP05	161-2828	100.79	95.99

Short Body Inductive Proximity Sensors



Flush Mountable



Position sensing now even possible where there was never before space for a sensor. Assemblies can be shrunk even further since the sensors require less space. This range of extremely small sensors can be integrated into compact assemblies such as linear slides, valves and actuators. Useful for applications involving extremely rapid accelerations such as pick and place, thanks to a weight of just 0.7g.

- Tubular 6.5mm and M8 stainless steel housings
- Entire electronics built into just 6mm long housing.
- No external amplifier required
- Normally Open, PNP output
- Output short circuit and reverse polarity protected
- M8 3 Pin or 2m Wire Lead Connection, depending on model
- 24V dc operating voltage
- Operating temperature from -25 to 70°C
- IP67 rated for arduous environments

For suitable connector/cable see Order Code 160-6720

515415

Dia. (mm)	Sense Dist.	Output Type	Mfrs. List No.	Order Code	1+	5+	10+
6.5	1.5mm	M8 Connector	BES G06EA-PSD15B-S49G	161-2831	108.19	103.04	97.89
6.5	1.5mm	Wire Leads	BES G06E60-PSC15B-EP02	161-2832	108.19	103.04	97.89
6.5	1.5mm	Wire Leads	BES G06EA-PSC15B-EP02	161-2833	108.19	103.04	97.89
8	1.5mm	M8 Connector	BES M08EA-PSD15B-S49G	161-2834	84.12	80.11	76.10
8	1.5mm	Wire Leads	BES M08E60-PSC15B-EP02	161-2835	84.12	80.11	76.10
8	1.5mm	Wire Leads	BES M08EA-PSC15B-EP02	161-2836	84.12	80.11	76.10

Inductive Proximity Sensors

3 - Wire Connection



- Cylindrical housing sizes M8, M12 and M18
- Sensing distances available from 1.5mm to 8mm
- PVC cable connection
- Short circuit and polarity reversal protected
- LED output indicator
- Double insulated
- IP67 sealing specification



Housing material Nickel plated brass
Rated operating voltage 24V dc
Operating voltage range 10V to 30V dc
Operating temperature range -25°C to 70°C

Sensing range with steel square target size of face dia x 1 mm thick

231059

Size	Sense Dist.	Mfrs. List No.	Order Code PNP	1+	5+	10+
NPN Output						
M8	1.5mm	BESM08MI-NSC15B-BV03	NEW 160-6702	17.39	16.52	15.66
M12	2mm	BESM12MI-NSC20B-BV03	NEW 160-6704	15.34	14.57	13.81
M18	5mm	BESM18MI-NSC50B-BV03	NEW 160-6706	16.94	16.10	15.24
M8	2mm	BESM08MI-NSC20B-BV03	NEW 160-6708	17.39	16.52	15.66
M12	4mm	BESM12MI-NSC40B-BV03	NEW 160-6710	15.34	14.57	13.81
M18	8mm	BESM18MI-NSC80B-BV03	NEW 160-6713	16.94	16.10	15.24
PNP Output						
M8	1.5mm	BESM08MI-PSC15B-BV03	NEW 160-6703	17.39	16.52	15.66
M12	2mm	BESM12MI-PSC20B-BV03	NEW 160-6705	15.34	14.57	13.81
M18	5mm	BESM18MI-PSC50B-BV03	NEW 160-6707	16.94	16.10	15.24
M8	2mm	BESM08MI-PSC20B-BV03	NEW 160-6709	17.39	16.52	15.66
M12	4mm	BESM12MI-PSC40B-BV03	NEW 160-6711	15.34	14.57	13.81
M18	8mm	BESM18MI-PSC80B-BV03	NEW 160-6714	16.94	16.10	15.24
M8	2mm	BESM08MH1-PSC20B-S04G	NEW 160-6715	17.39	16.52	15.66
M12	4mm	BESM12MI-PSC40B-S04G	NEW 160-6716	15.34	14.57	13.81
M18	8mm	BESM18MI-PSC80B-S04G	NEW 160-6717	31.03	29.48	27.93

Stainless Steel Face Inductive

Proximity Sensors

Extended Sensing Range



Inductive steel faced sensors with long sensing distances are used especially in harsh environments and applications too extreme for standard sensors. They are resistant to abrasive media and aggressive coolants and lubricants with the stainless steel face giving an extra protection and a longer life.

- Extended switching distances (up to x3)
- M12 connector
- Rugged stainless steel sensing face
- Pressure rated 60 / 80 bar
- LED for visual indication of output state
- 24V dc operating voltage
- Operating temperature from -25 to 70°C
- IP67 rated for arduous environments

For suitable connector/cable see Order Code 160-6760

515401

Dia. (mm)	Sense Dist.	Output Type	Mfrs. Config. List No.	Order Code	1+	5+	10+
M12	6mm	PNP	NO	BES M12EG1-PSC60Z-S04G-S11	161-2829	108.19	103.04
M18	10mm	PNP	NO	BES M18EG1-PSC10Z-S04G-S11	161-2830	108.19	103.04

HyperPROX

Extended Sensing Range



- Extended sensing range
- Cylindrical housing sizes M5, M8, M12 and M18
- Short circuit and polarity reversal protected
- LED for visual indication of output state
- High IP67 rating for arduous environments

Hyperprox inductive proximity sensors with up to 4 x standard sensing distance. No matter how reliable your existing sensor, it is unlikely to withstand collision with metal objects. Revolutionary new technology combined with extremely high component specification has allowed Balluff to develop this problem solving family of sensors to allow the sensor to be mounted further away from the danger area and thus avoid expensive break-downs.

Operating Voltage 24V dc
Voltage range 10 to 30V dc
Current load Connection mA200
3 pin metric connector



Proximity Switches - Inductive - Balluff - continued

HyperPROX - continued

Extended Sensing Range - continued

241639

Size	Sense Dist.	Mfrs. List No.	Order Code	Price Each		
				1+	5+	10+
M8	4mm	BESM08MI-PSC40B-S49G	160-6774	59.49	56.52	53.54
M12	8mm	BESM12MI-PSH80B-S04G	160-6775	59.49	56.52	53.54
M18	12mm	BESM18MG1-PSC12B-S04G	160-6776	61.61	58.54	55.46
M8	6mm	BESM08MG1-PSC60F-S49G	160-6777	69.44	65.96	62.50
M12	10mm	BESM12MF1-PSC10F-S04G	160-6778	51.30	48.74	46.17
M18	20mm	BESM18ME1-PSC20F-S04G	160-6779	63.42	60.25	57.08
M5 *	5mm	BESM05ED-PSC50F-EP05	160-6780	111.86	106.26	100.68

* Supplied complete with 3mm diameter, 3 core, connecting cable

Analogue Measurement Sensors

Ultra Linear



- Ultra Linear 0..10V Analogue Output +/-3% linearity over entire measurement range.
- Additional temperature output on Ø6.5mm sensor
- High repeat accuracy
- Low temperature drift
- Rugged and Robust metal housing with high shock and vibration resistance
- Metric output connector

Self-contained analogue inductive sensors giving an Ultra linear voltage output directly proportional to the distance from the target.

Unique integrated circuits contained in the sensor mean that unrivalled linearity is achieved over the entire sensing distance.

In addition, the Ø6.5mm sensor has an extra output giving a voltage proportional to change in temperature.

This allows you to calculate the amount of the detected movement is actually due to expansion of the metal target caused by temperature change.

Voltage Supply 24V dc
Voltage Output 0 to 10 Vdc proportional to distance from target
Protection IP 67

241640

Size	Sense Distance	Mfrs. List No.	Order Code	Price Each		
				1+	5+	10+
6.5mm * 1.25mm		BAW G06EE-UAF20B-EP03-K	160-6781	106.35	101.03	95.72
M8	1mm	BAW M08EI-UAD15B-BP03	160-6782	102.86	97.72	92.57
M18	4mm	BAW M18MI-UAC50B-S04G	160-6783	100.26	95.24	90.22
M30	6mm	BAW M30ME-UAC10B-S04G	160-6784	103.86	98.67	93.47

* Supplied complete with 3mm diameter, 3 core, connecting cable

Proximity Switches - Inductive

Proximity Sensor

Inductive - V3 Style Miniature

proxistor.

New



- Precise mounting, easy to fit
- Similar housing to V3 microswitch
- Sealed to IP 65
- Designed to be flush mounted
- 2m, 3-wire connecting cable
- Sensing Distance assured from 0 - 1.6mm

Body - H = 16.5, W = 30, D = 10.5mm

Supply voltage 10 to 30V dc
Output Normally Open, 200mA max. load
Sensing distance 2mm

Switching frequency 1000Hz max.
Temperature range -25°C to +70°C
Protection IP 65

505004

Output Type	Mfrs. List No.	Order Code	Price Each		
			1+	5+	10+
PNP	IPO-002-VSF-LFmm	120-5165	23.88	21.77	19.31
NPN	INO-002-VSF-LFmm	120-5166	35.31	32.19	28.56

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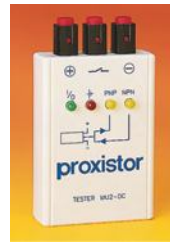


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Farnell

Proximity Switch Tester

proxistor.



- Suitable for testing 2 and 3 wire proximity switches, including inductive, photo-electric, capacitive and ultrasonic
- Ideally suited to 'point of use' testing
- Audio and visual indication
- Supplied and fitted with batteries, ready for use

H=104, W=60, D=29

Indication of proximity switch function NPN or PNP, normally closed or normally open, light-on or dark-on operation
Auto-on/off feature Unit is powered only when a proximity switch is connected
Battery DC = 2.9V (PP3)

212302

Mfrs. List No.	Order Code	Price Each		
		1+	5+	10+
MU2-DC	721-3803	38.74	35.84	34.61

Flat Pack, dc, Prewired and M12 Plug-In EI 55 Series



Manufactured in a flat pack housing of grey polycarbonate, these inductive proximity sensors are available in two operating types. The first is designed for flush mounting in metal and has a sensing distance of 10mm. The second is non-flush mounting and has a sensing distance of 15mm. Both units are easily mounted using two M3.5 screws.

- Sensing distance of 10 or 15 mm depending on model
- Choice of NPN or PNP output
- Units have both make and break switching with LED indication
- Sensors are sealed to IP67
- Available prewired or with M12 standard plug

Connection Method	Mounting Style	Output	Sensing Distance	Mfrs. List No.	Order Code
Prewired cable	Flush	PNP	10mm	EI 55 10 PPAP	711-5003
Prewired cable	Non-Flush	NPN	15mm	EI 55 15 NPAP	711-5015
Prewired cable	Non-Flush	PNP	15mm	EI 55 15 PPAP	711-5027
M12 connector	Non-Flush	PNP	15mm	EI 55 15 PPAP-1	711-5064

224743

Prewired		Order Code	Price Each			
			1+	5+	10+	25+
Flush,	PNP	711-5003	35.70	33.30	32.64	30.62
Non-Flush,	NPN	711-5015	35.70	33.30	32.64	30.62
Non-Flush,	PNP	711-5027	35.70	33.30	32.64	30.62
M12 Plug-in						
Non-Flush,	PNP	711-5064	40.20	37.49	36.75	34.53

Sensor Mounting Bracket

THORPE PRODUCTS



- High quality, fully adjustable mounting bracket for all types of barrel sensors
- Constructed from Black Nylon 66, with stainless steel fasteners and a zinc plated knurled pin
- Supplied complete with a kit of parts to fit sensor diameters 4mm, 5mm, 12mm, 14mm, 18mm and 30mm
- Two M4x20mm zinc plated cap head screws are supplied for fixing the bracket in position

212417

Mfrs. List No.	Order Code	Price Each		
		1+	5+	10+
TP-30	311-5379	7.49	7.35	6.85

Proximity Switches - Ultrasonic

Piezoelectric Ceramic Sensors (Piezotite®)

muRata

Ultrasonic Sensor



- Operating temperature -30 to 85°C
- Receiver sensitivity -63 typ. (0dB = 10V/Pa)
- Transmitter S.P.L. 120 typ. (0dB = 0.02mPa)
- Dual Use sensitivity 20mVp-p typ.
- Ideal for Burglar alarms, range finders, automatic doors and remote controls
- Open Structure
- Compact and light weight
- High sensitivity and sound pressure
- Less power consumption
- High reliability
- Nominal frequency 40kHz
- Resolution 9mm

Using Method	Directivity (°)	Capacitance (pF)	Detectable Range (m)	Max. Input Voltage	Order Code
Receiver	50	2000	0.2 to 6	-	100-6202
Transmitter	50	2000	0.2 to 6	40 Continuous Signal	100-6203
Dual use	60 typ.	2550	0.5 to 2	20 Pulse width 0.4ms Interval 100ms	100-6205

338653

Mfrs. List No.	Order Code	1+	Price Each	5+	10+
MA40B8R	100-6202●	3.33	2.79	2.39	
MA40B8S	100-6203●	3.33	2.79	2.39	
MA40S5	100-6205●	3.07	2.56	2.19	

Piezoelectric Ceramic Sensors (Piezotite®) High-Frequency Type



- Used for precise applications
- Ideal for approach switches for FA, distance meters and water or liquid level meters

Dimensions:
47x24.5

Nominal Frequency	Overall Sensitivity (dB)	Angle Detectable Range (°)	Detectable Range (m)	Max. Input Voltage	Order Code
75kHz ±5	-47 min. (0dB = 18Vpp @ 50cm)	7	0.5 to 5	120 Pulse width 0.6ms Interval 50ms	100-6206

338654

Mfrs. List No.	Order Code	1+	Price Each	5+	10+
MA80A1	100-6206●	75.86	70.02	65.03	

Compact, Switch Output Adjustable Switch Point and Time Delay



- User adjustment of delay time
- User adjustment of range 100 to 500 mm
- Housing protected to IP67
- Small compact design
- Easy mounting options:- M4 thru-holes or M18 thread
- Switch status LED
- Detection of small poorly reflecting objects
- Detection unaffected by dust, waterdrops, strong sunlight etc.
- Distance measurement unaffected by target material
- Input protected against power reversal

Body H=46, W=18, D=30,
Overall W=40, Cable L=1.5m
Mounting: Thread=M18,
2x4.1 dia thru-holes, F.C=20

Versatile ultrasonic proximity switch in compact polyamide (glass fibre filled) case for object detection regardless of size, colour and target material.

Operating voltage V_s	12 to 24V
Scanning range	100 to 500mm
Switching point	Adjustable 100 to 500 mm
Time delay	Adjustable 0.2 to 7 secs
Resolution	±1.6 mm typ.
Detection sensitivity	100% @ V_s =24V, 80 to 90% @ V_s =15V
Carrier frequency	175kHz
Output	PNP or NPN open collector 100mA, short-circuit proof
Operating temperature	-15°C to +60°C

212350

Output	Mfrs. List No.	Order Code	1+	5+	10+	25+
PNP	UPX500 PVPS 24	732-801	152.16	138.32	130.64	122.96
NPN	UPX500PVNS 24.	732-813	152.16	141.11	133.26	125.41

M30, Switch Output With 2 Teachable Switch Points



- One programmable switch output
- Nickel-plated brass IP65 housing
- Tamper-proof programming

The sensor switch points can be set by applying the supply voltage to the teach inputs or programming unit.

UB500, UB2000:L=94, Head dia.=M30, UB4000:L=109, Head dia.=40,
UB5000:L=115, Head dia.=74, All types:Thread size M30x1.5

Operating voltage	20 to 30V dc	Response time	480ms
Switch outputs	200mA (PNP)	Hysteresis	≤1% of operating distance
LED indicators	Green=Power on, Red=Fault, Yellow=Switch condition	Reproducibility	≤1%
Temperature range	-25°C to +70°C		

222161



Sensing Range (mm)	Mfrs. List No.	Order Code	1+	5+	10+
60 to 500	UB500-30GM-E5-V15	709-7931	139.760	135.580	132.770
200 to 2000	UB2000-30GM-E5-V15	709-7943	143.680	139.370	136.500
500 to 4000	UB4000-30GM-E2-V15	709-7955	155.180	150.520	147.430
800 to 6000	UB6000-30GM-E2-V15	709-7967	139.855	136.677	133.640
Programming Unit	UB PROG 2	709-7979	46.370	45.440	44.530

M30, Analogue Output, Stainless Steel 4-20mA/0-10V, Temperature Compensated



The sensor has a four position insert to program the limit values of the analogue output and also to compensate for temperature drift.

- User-defined analogue outputs (current or voltage)
- Stainless steel IP65 housing
- Temperature compensation

UC300, UC500, UC2000:L=114, Head dia.=M30,
UC4000:L=125, Head dia.=M40, UC6000:L=132,
Head dia.=73, All types: Thread size M30x1.5

Operating voltage	10 to 30V dc	LED indicators	
Repeatability	0.1% of full scale	Dual-Green	Power on
Linearity	0.1% of full scale	Dual-Red	Object not detected/disturbance
Current output	4 to 20mA	Yellow	Limit value 1
Voltage output	0 to 10V	Yellow	Limit value 2

222162

Sensing Range (mm)	Mfrs. List No.	Order Code	1+	5+	10+
15 to 300	UC300-30GM-IU-R2-V15	372-6241	258.97	251.21	246.02
30 to 500	UC500-30GM-IU-R2-V15	709-8029	252.53	244.96	239.90
80 to 2000	UC2000-30GM-IU-R2-V15	709-8030	285.98	280.26	274.65
200 to 4000	UC4000-30GM-IUR2-V15	709-8042	267.95	259.92	254.56
350 to 6000	UC6000-30GM-IUR2-V15	709-8054	284.13	275.60	269.92

Photoswitches - Optical - Balluff



Through Beam Slot Sensors BGL Series - Anodized Aluminium



A robust alternative to fiber optic cables needing no separate amplifier. Installation is simple as they are ready aligned and need no bracket allowing a more accurate, less expensive and more robust installation than fiber optic cable. A full range of slot sizes ensure

that virtually any sensing task can be handled. Also included is the laser range of through beam slot sensors with a smallest detection of 0.6µm and with NO/NC and sensitivity adjustment.

- Easy installation and setup
- High switching frequency of 1500Hz
- Adjustable sensitivity
- PNP output, switchable to Normally Open or Normally Closed
- Output short circuit and reverse polarity protected
- M8 3 Pin Connector
- Slim 10mm height profile
- 10 to 30V dc operating voltage
- Operating temperature from -10 to 60°C
- 30mm, 50mm, 80mm and 120mm slot options
- IP65 rated

For suitable connector/cable see Order Code 160-6720

Slot	Dimensions	Sensor	Mfrs.	Price Each			
Width (mm)	W x D (mm)	Type	List No.	Order Code	1+	5+	10+
50	70 x 79	Red LED	BGL 50A-001-S 49	161-2837●	128.99	122.85	116.71
80	100 x 79	Red LED	BGL 80A-001-S 49	161-2838●	134.80	128.39	121.97
30	50 x 59	Laser	BGL 30A-003-S 49	161-2841●	295.96	281.87	267.77
50	70 x 79	Laser	BGL 50A-003-S 49	161-2842●	304.37	289.87	275.38
80	100 x 79	Laser	BGL 80A-003-S 49	161-2843●	312.61	297.72	282.84
120	140 x 84	Laser	BGL 120A-003-S 49	161-2844●	324.39	308.94	293.49

Through Beam Angle Sensors BWL Series - Anodized Aluminium



45° "L" shaped through beam sensors, robust metal housing NO/NC adjustable, sensitivity adjustment, and complete self contained with no external amplifiers or fibers. Many applications including assembly handling, robotics, position and orientation control.

- Anodized aluminium construction
- High switching frequency
- Adjustable sensitivity
- PNP output, switchable to Normally Open or Normally Closed
- Output short circuit and reverse polarity protected
- M8 3 Pin Connector
- 10 to 30V dc operating voltage

Photoswitches - Optical - Balluff - continued

Through Beam Angle Sensors - continued

BWL Series - Anodized Aluminium - continued

- Operating temperature from -10 to 60°C
- IP67 rated for arduous environments

For suitable connector/cable see Order Code **160-6720**

51549

X & Y Sens. Distance	Sensor Type	Mfrs. List No.	Order Code	1+	5+	10+
40mm	Red LED	BWL 4040-D-R011-S49	161-2845	141.10	134.38	127.65
54mm	Red LED	BWL 5454-D-R011-S49	161-2846	151.85	144.62	137.38
68mm	Red LED	BWL 6868-D-R011-S49	161-2847	161.24	153.56	145.88
90mm	Red LED	BWL 9090-D-R011-S49	161-2848	200.65	191.10	181.55
110mm	Red LED	BWL 110110-D-R011-S49	161-2849	216.34	206.04	195.74
54mm	Laser	BWL 5454-D-L011-S49	161-2850	279.48	266.18	252.87
68mm	Laser	BWL 6868-D-L011-S49	161-2851	288.90	275.15	261.40
90mm	Laser	BWL 9090-D-L011-S49	161-2853	299.66	285.39	271.12

Photoswitches - Optical- Sick

Compact - W9 Series

SICK



H=40 W=12 D=22

Sensing distance Diffused, 30-250mm (BGS), 10-20mm Focussed, 10-450mm and 10-1500mm Standard

Supply voltage 10 to 30V dc

Output PNP, 100mA

Switching Mode Light / Dark selectable

Switching Frequency 800 Hz or greater

Operating Temperature -40°C to 60°C

249399

- Insensitive to high ambient light and adjacent sensor light sources
- PNP output
- Light/Dark switching
- Visible red LED and long range IR
- Sensitivity/Range adjustable
- M12 4 pin connector
- Compact plastic housing
- Output indicator LED
- Circuit protection

Diffuse, Polarised Reflex

Miniature Prewired - W150 Series

SICK



- Miniature photoswitches with integral amplifier
- Sensitivity adjustment by potentiometer
- Light-on/dark-on operation selected by control wire
- UL Recognised
- IP67 protection
- Reflex type supplied with PL20A reflector
- Supplied with mounting bracket

H=28 (body), W=10, D=17, Cable L=2m

Sensing distance (max.) Diffuse = 200, Diffuse with background suppression=100, Polarised reflex=2m

Supply voltage 10 - 30V dc

Output PNP or NPN transistor

Output current 100mA max.

Switching frequency 1000 per sec.

212372

Output	Mfrs. List No.	Order Code	1+	5+	10+
Diffuse					
PNP	WT150-P132	722-9392	56.380	52.440	48.780
NPN	WT150-N132	722-9409	44.220	41.130	39.156
Diffuse with Background Suppression					
PNP	WT150-P162	722-9410	72.570	69.650	68.240
NPN	WT150-N162	722-9422	76.610	73.510	72.040
Polarised Reflex					
PNP	WL150-P132	722-9434	56.380	52.440	48.780
NPN	WL150-N132	722-9446	56.380	52.440	48.780

Compact - W160 Series



H=33 W=11 D=23

Sensing Distance

Supply voltage

Output

Switching Mode

Switching Frequency

Operating Temperature

- Plastic housing
- PNP output
- Light/Dark switching
- Polarised Reflex or Optical Proximity versions
- Visible red LED
- 2 metre 3 core cable or M8 4 pin connector versions
- Sensitivity/Range adjustable
- Output indicator LED
- Circuit protection
- P250 Reflector supplied with Reflex types
- Mounting bracket supplied
- UL Recognised and CSA approved

Reflex: 0.01 to 6m using PL80A reflector

Reflex: 0.005 to 4m using P250 reflector

Diffused: 0 to 900mm

10 to 30V dc

PNP, 100mA

Light / Dark selectable

1000 Hz

-25°C to 55°C

249408

	Mfrs. List No.	Order Code	1+	5+	10+
Reflex					
PNP, Cable	WL160-F142	414-7716	84.66	78.73	73.23
PNP, M8 Connector	WL160-F440	414-7728	84.66	77.89	71.66
Diffused					
PNP, Cable	WT160-F182	414-7730	67.48	66.14	64.81
PNP, M8 Connector	WT160-F480	414-7741	83.60	81.95	80.31

Polarised Reflex - W12 Series

Transparent Object Sensor

SICK



H=49.2, W=15, D=43

Sensing distance

Supply voltage

Output

Response time

- Metal housing (zinc diecast)
- Sensitivity control
- Insensitive to external light sources
- Switching outputs short circuit protected
- Transparent object sensor has polarised reflex sensing, and reliably detects glass, plastic products and transparent film etc.
- Light/dark operation (via control wire)
- 5-pin M12 connection
- Supplied with 2 fixing clamps
- Adjustable mounting bracket available separately
- IP67 protection

Transparent object sensor=1.5m

10 - 30V dc

PNP/NPN (transparent object sensor)

Reflex types=360µs

222153

	Mfrs. List No.	Order Code	1+	5+	10+
Plug-In					
Transparent object sensor	WL12-2B560	730-300	142.88	132.90	123.60
Mounting bracket	2013942	730-312	12.27	11.78	11.54

Diffuse with Background Suppression, Polarised Reflex

PNP or Relay Output; Prewired - W250 Series

SICK



H=60, W=20, D=43, Cable L=2m

Sensing distance

Output

Output current

Supply voltage

Switching mode

- Robust and compact plastic housing
- Choice of SPCO relay or PNP transistor output
- Detection distance setting with position indicator
- Diffused types have 150 - 500mm scanning range with background suppression
- Polarised reflex types suitable for detecting objects with glossy surfaces
- Light/dark switching selectable by control line (PNP types)
- Reflector supplied with reflex types
- IP67 protection
- UL Recognised
- Supplied with mounting bracket

Diffuse=150 to 500mm, Reflex=0.01 to 8m

SPCO Relay open collector or SPCO Relay relay

PNP types=3A, Relay types=3A@ 240V ac/30V dc

PNP types=12 to 240V dc, Relay types=12 to 240V dc

PNP types=light/dark switching (via control line)

Relay types=light switching

PNP types=33 per sec, Relay types=33 per sec

Switching frequency

212369

Over 480,000 products online

QGO

Output	Mfrs. List No.	Order Code	1+	5+	10+
Diffuse with Background Suppression					
Relay	WT250-S162	722-9460	91.26	87.59	85.83
Polarised Reflex					
PNP	WL250-P132	722-9471	78.06	72.60	67.52
Relay	WL250-S132	722-9483	76.53	71.18	66.20

Polarised Reflex - W36 Series

SICK



High performance and robust polarised reflex sensor suitable for use on conveyor systems and all automated machinery. Available for 10-30V dc supply with NPN/PNP transistor output or for 24-240V ac/dc supply with SPCO relay output. Adjustable mounting bracket and choice of reflectors available separately.

- Switch selectable time delays
- Sensitivity control
- PG11 cable gland
- Light/dark operation (switch selectable)
- Enclosure sealing to **IP67**
- Terminal chamber connection
- Test input and alarm output (transistor output type)

H=85 (excl. connector), W=36, D=72

Max. sensing distance	15m (with 730-440 reflector), 12mm (with 730-439), 11mm (with 730-427)
Supply voltage	10 to 30V dc (730-257), 24 to 240V ac/dc (730-269)
Output	PNP / NPN transistor (730-257), SPCO Relay 3A 250V ac (500VA)
Power consumption	40mA (730-257), 2VA (730-269)
Time delays	0.02-1s (730-257) 0.5-12s (730-269)
Response time	1.25ms (730-257), 20ms (730-269)
Mfrs. List Nos.	WL36-B230=730-257, WL36-R230=730-269, 2005806=730-270

222152

	Order Code	1+	5+	10+
Photoswitch, transistor output	730-257	151.83	145.72	142.81
Photoswitch, relay output	730-269	160.28	153.84	150.75
Mounting bracket	730-270	13.35	12.81	12.55

W260 Series

SICK



H=77.5, W=25, D=63,
Reflector (overall)=60.9 x 50.9

- SPNO relay output
- Light/dark operation (switch selectable)
- Protection to **IP66**
- Mounting bracket and cable gland supplied
- Adjustable sensitivity
- **UL** Recognised and **CSA** approved
- Reflector supplied with reflex types
- Reflex types use polarised red light thereby eliminating risk of malfunction due to shiny surfaces
- Terminal chamber connection with 2-position cable entry gland
- Polarised reflex type available with or without time delays

Sensing distance	Diffuse=2m
Supply voltage	12-240V dc, 24-240V
Output	SPCO Relay 3A @ 240VAC / 30VDC
Power consumption	2VA
Response time	20ms
Time delays (timer version)	OFF-delay/ON-delay (switch selectable), delay adjustable 0.1-5s

212260

	Mfrs. List No.	Order Code	1+	5+	10+
Diffuse	WT260-S280	723-4594	72.20	69.27	67.89
Polarised reflex	WL260-S270	730-282	90.37	86.71	84.98
Polarised reflex with timer	WL260-R270	730-294	87.33	81.22	75.54

Slot Sensors - WF Series

SICK



WF15: Slot W=15, D=40, Body H=50, W=12, D=60

- Solid aluminium housing
- Simple and accurate sensitivity adjustment by 25-turn potentiometer
- Choice of PNP/NPN and light-on/dark-on switching (wire selectable)
- 4-pin M8 plug connection

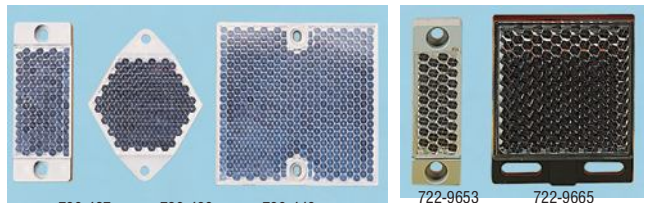
Light source	Infrared LED
Supply voltage	10-30V
Switching output	PNP/NPN, Light/Dark Switching
Response time	1ms
Operating temperature	-20°C to +60°C

222170

Slot Width	Mfrs. List No.	Order Code	1+	5+	10+
15mm	WF15-40B410	723-4570	111.33	103.53	96.28

Reflectors

SICK



Overall dims:	730-427	730-439	730-440	722-9653	722-9665
H=82, W=30, D=7.2, Fixing centres=71 (Dia. 4.5)					
H=78, W=60, D=8, Fixing centres=68 (Dia. 4.8)					
H=84, W=84, D=8.5, Fixing centres=71 (Dia. 4.5)					
H=60, W=18, D=7.3, Fixing centres=50 (Dia. 4.6)					
H=60.9, W=50.9, D=8.5, Fixing centres=30 (Dia. 4.3)					

High performance prismatic reflectors.

Mfrs. List No.	PL30A = 730-427, PL20A = 722-9653,	PL50A = 730-439, P250 = 722-9665	PL80A = 730-440,
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212252

	Order Code	1+	5+	10+	25+	50+
Rectangular, 82 x 30mm	730-427	9.42	8.76	8.59	8.41	8.24
Hexagonal, 78 x 60mm	730-439	9.71	9.32	9.13	8.78	7.94
Square, 84 x 84mm	730-440	13.72	12.77	12.49	12.22	11.95
Rectangular, 60 x 18mm	722-9653	5.32	4.93	4.79	4.67	4.56
Square, 61 x 51mm	722-9665	7.16	6.66	6.53	6.40	6.27

Photoswitches - Optical - Omron

OMRON

M18 Diffuse and Reflex - E3F2 Series



ac type: M18 x 80, dc types: M18 x 65
Reflector supplied with reflex type

- Light-on/dark-on operation is wire selectable (dc types)
- Short-circuit and reverse connection protection (dc types)
- AC type is **UL** Recognised and **CSA** approved
- DC type is **UL** Recognised
- **IP66** sealing
- LED output indication

- Potentiometer sensitivity adjustment on long range (300mm) diffuse sensors
- Reflector supplied with reflex types

A range of compact cylindrical photoswitches in M18 ABS resin housings.

Mfrs. List No.	Order Code	Mfrs. List No.	Order Code
E3F2DS10B4N	160-3060	E3F2DS10Z1	160-3053
E3F2DS30B4	160-3056	E3F2R4C4 2M	160-3057
E3F2DS10C4N	160-3059	E3F2R4B4 2M	160-3058
E3F2DS30C4	160-3055	E39R1	160-3054

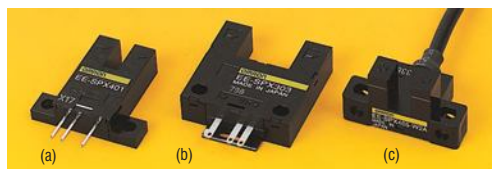
212460

Sensing Distance	Voltage	Output	Order Code	1+	5+	10+
Diffuse						
100mm	12 to 30V dc	PNP	160-3060	44.37	41.27	40.22
300mm	12 to 30V dc	PNP	160-3056	44.37	41.27	40.22
100mm	10 to 30V dc dc	NPN	NEW 160-3059	44.37	41.27	40.22
300mm	10 to 30V dc dc	NPN	NEW 160-3055	44.37	41.27	40.22
100mm	22 to 264V ac	Thyristor	160-3053	44.37	41.27	40.22
Reflex						
2m	12 to 30V dc	NPN	160-3057	44.37	41.27	40.22
2m	12 to 30V dc	PNP	160-3058	44.37	41.27	40.22
Spare Reflector			160-3054	8.20	7.64	7.47

Subminiature - Through-beam (Slotted)

OMRON

EE-SPX, EE-SX Series



(a) EE-SPX301/401: H=24, W=26, D=7, F.C.=20

(b) EE-SPX303/403: H=26, W=26, D=7.4, F.C.=19.5

(c) EE-SPX305/405-W2A: H=15.5, W=27.2, D=15.5, Cable L=1m



(d) EE-SX670: H=22.2, W=25.4, D=7, F.C.=19

(e) EE-SX671: H=15.5, W=26.2, D=14.5, F.C.=19



Photoswitches - Optical - Omron - continued

Subminiature - Through-beam (Slotted) - continued

EE-SPX, EE-SX Series - continued

- (f) EE-SX672: H=22.2, W=13.4, D=26, F.C.=19
 (g) EE-SX673: H=22.2, W=13.4, D=12.8, F.C.=7

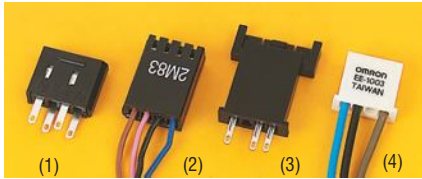
- Built-in amplifier circuitry allows direct switching of PLC and relay outputs
- Applications include robot control, cam timer switching, general position and object detection
- All slotted sensors have light-on indication
- Variety of slot widths, mounting and termination styles
- Mating connectors and connecting leads available

Slot Width	Output	Load	Supply Voltage	Connector Code	Mfrs. List No.	Order Code
Modulated light, PCB mountable						
3.6mm	Light - Off	80mA	12 - 24V dc	3 or 4	EE-SPX301	721-3992
Dust-proof slit, 100mA switching						
5mm	Light - On/Off	100mA	12 - 24V dc	1 or 2	EE-SX670	721-4017
5mm	Light - On/Off	100mA	5 - 24V dc	1 or 2	EE-SX671	162-7015
5mm	Light - On/Off	100mA	12 - 24V dc	1 or 2	EE-SX672	721-4030
5mm	Light - On/Off	100mA	12 - 24V dc	1 or 2	EE-SX673	721-4042
Wide slot						
13mm	Light - Off	80mA	12 - 24V dc	1 or 2	EE-SPX303	721-4054
Modulated light, prewired 1m leads						
5mm	Light - On	80mA	12 - 24V dc	N/A	EE-SPX405-W2A	721-4080

212306

Mfrs. List No.	Order Code	1+	5+	10+	25+	100+
EE-SPX301	721-3992	25.73	25.23	24.73	23.78	21.17
EE-SX670	721-4017	12.97	12.70	12.45	11.99	10.66
EE-SX671	162-7015	13.53	13.20	12.81	11.98	10.74
EE-SX672	721-4030	14.56	12.01	10.20	8.73	8.25
EE-SX673	721-4042	12.28	12.03	11.79	11.35	10.10
EE-SPX303	721-4054	30.10	29.50	28.92	27.80	24.77
EE-SPX405-W2A	721-4080	51.21	50.20	49.20	48.20	43.75

Connectors for EE Subminiature Photoswitches



Connectors and connecting leads for Omron EE subminiature photoswitches.

212307

Connector Code	Lead Length	Mfrs. List No.	Order Code	1+	10+	25+
1	—	EE-1001	721-4091	2.37	2.31	2.23
2	2 mtr	EE-1006	721-4108	11.89	11.59	11.21
3	—	EE-1002	721-4110	1.78	1.75	1.69
4	1 mtr	EE-1003	721-4121	8.04	7.85	7.56

'Mini' Side-view and Flat Packages - E3T

Diffuse, Separate



- Very small size saves installation space
- 'Pin-point' beam (1-2mm) ideal for detecting minute sensing objects
- Minimal influence of background or ambient shiny metal objects

Power supply 12 to 24V dc \pm 10% (ripple 10% max.)
 Control output NPN or PNP open collector, load current: 50mA max. at 24V dc
 Operation mode Diffuse = light-ON; Separate = dark-ON
 Response time 1ms max. for both operation and release
 Operating temperature -25°C to +55°C
 Enclosure rating IP67

Package	Side-view	Flat pack
H	20.6	20.8
W	7	12
D	11.2	3.7
E3T-FD11 =	721-3761,	E3T-FD13 = 722-6445,
E3T-ST12 =	721-3797,	E3T-ST14 = 722-6470,

222158

Sensing Distance	Style	Output	Order Code	1+	Price Each	5+	10+
Diffuse							
5 to 30mm	FLAT	NPN	721-3761	69.35	66.22	63.96	
5 to 30mm	FLAT	PNP	722-6445	69.35	66.22	63.96	
Separate							
1m	Side-view	NPN	721-3797	69.75	61.65	60.11	
1m	Side-view	PNP	722-6470	76.64	72.81	69.18	

Diffuse, Polarised Reflex, Separate - E3S-A Series



Cable
 Reflex: H=22.3, W=12.4, D=42.3
 Diffuse, separate: H=22.3, W=12.4, D=40

- LED indication for output and stability status
- Light-on/dark-on operation is switch selectable
- Small variation in sensitivity between sensors allows quick adjustment of multiple sensors
- Close alignment of optical axis to mounting position (2° max.) permits quick alignment
- Plastic housing protected to IP67
- Reflector supplied with reflex types

Sensing distance	Current consumption	Control output (max.)
Diffuse	Diffuse	Response time
Polarised reflex	Polarised reflex	
Separate	Separate	
Supply voltage	10 to 30V dc	100mA, 30V dc max.
Temperature range	-25°C to +55°C	0.5ms

Mfrs. List No.	Order Code	E3SAR31	160-3067
E3SAD11	160-3064	Mfrs. List No.	Order Code
E3SAD31	160-3065	E3SAT11	160-3068
E3SAR11	160-3066	E3SAT31	160-3069

222142

Type	Output	Order Code	1+	Price Each	5+	10+
2 Metre Lead						
Diffuse	NPN	160-3064	75.63	70.76	68.55	
Diffuse	PNP	160-3065	75.63	70.76	68.55	
Polarised reflex	NPN	160-3066	80.74	75.55	73.20	
Polarised reflex	PNP	160-3067	80.74	75.55	73.20	
Separate	NPN	160-3068	98.74	92.39	89.52	
Separate	PNP	160-3069	98.74	92.39	89.52	

Diffuse and Separate - E3S Series

Horizontal Appearance



160-3063, 175-728: H = 21, W = 15, D = 50
 160-3062, 1603436: H = 19, W = 15, D = 50
 Reflector H = 60, W = 40, D = 7
 Cable L = 2m

- LED indication of output and stability status
- Operation mode selectable by changing power supply polarity
- UL listed
- Diecast housed types protected to IP67
- Plastic housed types protected to IP65
- Reflector supplied with reflex type

Sensing distance	Current consumption	Load current
Diffuse	Diffuse	Response time
300mm (diecast housed)	Separate	Diffuse
Separate	2m (plastic housed)	Separate
5m (diecast housed)	12V dc -10% to 24V dc +10%	Temperature range
Supply voltage	(230V ac using S3 or S3D2 controller)	-25°C to +55°C

Mfrs. List No.	Order Code	E3S2E4	160-3062
E3S-DS10E4	103-362	E3S-2B4	160-3436
E3S-DS10B4	175-728	E39R1	160-3054
Mfrs. List No.	Order Code		

212466

Housing	Output	Order Code	1+	Price Each	5+	10+
Diffuse Type						
Plastic	NPN	160-3063	113.71	108.03	102.30	
Plastic	PNP	175-728	113.71	108.03	102.30	
Separate Type						
Plastic	NPN	160-3062	172.22	163.60	154.98	
Plastic	PNP	NEW 160-3436	156.55	142.93	132.44	
Separate Reflector		160-3054	8.20	7.64	7.47	

Polarised Reflex

Long Range, Metal Housing - E3S-C Series



- Sensing to 3m
- Robust metal housing with protection to IP67
- Mutual interference protection
- Light-on/dark-on operation and NPN/PNP output selectable by switches under top cover
- LED indication of output and stability status
- Supplied with stainless mounting brackets
- Reflector supplied

H = 23, W = 20.4, D = 50,
Cable L = 2m

Sensing distance	0 to 3m
Current consumption	40mA
Supply voltage	10 to 30V dc
Control output	Open collector 100mA max., 30V dc max.
Response time	1ms
Temperature range	-25°C to +55°C

212190

Type	Mfrs. List No	Order Code	1+	5+	10+
Horizontal Mounting					
Polarised reflex	E3S-CR11	532-411●	126.59	117.74	89.26

Clear Glass Sensor - E3S-CR67-C

Metal Housing



- Optimum sensor for detecting transparent glass and plastic bottles
- Retro-reflective sensor gives stable detection of lined-up bottles with 5mm adjacent spaces
- Ensures smooth detection of transparent objects at 1m sensing distance
- Employs visible LED light source producing pin-point 5mm diameter beam
- Easy sensitivity adjustment
- Supplied with mounting bracket
- Plug-in connection (4-pin M12)

Sensor: H=57 (body),
75 (overall), W=20.4, D=23

Reflector: H=59.9, W=40.3, D=7.5

Supply voltage	10 to 30V dc
Sensing distance	0 to 250mm, using E39-R6 reflector 250 to 1000mm, E39-R1 reflector
Control output	30V dc x 100mA max, NPN or PNP (selectable) Open collector, light-ON/dark-ON (selectable)
Indication	Stability (Green), light reception (Red)
Protection	IP67
Ambient temperature	-25°C to +55°C

222173

	Mfrs. List No.	Order Code	1+	5+	10+
Clear glass sensor	E3S-CR67-C	722-6550●	127.03	120.68	114.65
Reflector, 0 to 250mm	E39R1	160-3054●	8.20	7.64	7.47
Reflector, 250 to 1000mm	E39-R6	722-6573	9.52	8.86	8.68

Diffuse - High Precision Background Suppression

E3S-CL



- High definition sensor, easily adjusted to detect objects at a specific distance, disregarding the background or colour
- Switch selectable operation for NPN or PNP output and dark or light response
- Robust IP67 protected construction resists water, oil and detergent

H=43.7, W=15.4, D=40, Cable L=2m

Setting distance	674-369: 40 to 200mm,	674-370: 50 to 500mm
Detection distance	674-369: 5 to 200mm,	674-370: 5 to 500mm
Repeat accuracy:		
Perpendicular to optical axis	0.5mm max.	
In direction of optical axis	674-369: 1mm max.,	674-370: 10mm max.
Supply voltage	10 to 30V dc	
Control output	100mA (max.) @ 30V dc, NPN / PNP Selectable	
Response time	1ms max. for both operation and release	
Sensitivity adjustment	Six turn, adjuster with indicator	

Mfrs. List No. E3S-CL1=674-369, E3S-CL2=674-370

212224

Detection range	Order Code	1+	5+	10+
5mm to 200mm	674-369●	145.00	136.30	131.68
5mm to 500mm	674-370●	180.03	171.90	166.07

Slot Sensor

E3S-GS Series



- Sensor detects marks on transparent, opaque or translucent targets with sensing range of 30mm
- Robust metal body, protected to IP67
- LED indication of output and stability status
- Adjustable sensitivity
- Operation mode is wire selectable
- Direct switching of NPN or PNP loads

H=52, W=20, L=80, Fixing centres=40 (Dia. 6.5), Slot
W=30, D=45, Cable L=2m

Sensing distance	30mm	Output current (max.)	NPN 80mA, PNP 100mA
Supply voltage	12 to 24V dc	Response time (max.)	1ms
Current operation	40mA	Operating temperature	-25°C to +55°C

212186

Output	Order Code	1+	5+	10+
NPN	160-3017●	148.59	138.20	128.64
PNP	160-3018●	148.59	138.20	128.64

Controller - S3D2



H=80, W=30, D=78

Supply voltage	100 to 240V ac ac ±10% 50/60Hz
Power consumption	15VA max.
Sensor supply	12V dc, 200mA max.
Input signal	NPN: ON, 0 to 4V (5mA min.), OFF, 8 to 12V (2mA max.)
Response time	0.1 ms
Control output	SPDT, 3A max. @ 250V ac ac
Time range	0.1 to 1 sec., 1 to 10 sec., selectable
Temperature range	-10°C to +55°C

OMRON

- Compact multifunction controller for one or two proximity or photoswitches
- Programmable relay output - on-delay, off-delay or one-shot operation
- 'AND' or 'OR' logic functions can be configured
- 'Leading edge' facility

When two sensors are used to inspect an object on a production line the 'leading edge' facility of the controller can be set to only operate on the first 0.1ms of one of the input signals. This is particularly useful in 'GATE' and 'CHECK' applications allowing high speed detection, e.g. whether a bottle has a cap, whether a syringe has a needle, missing labels.

212187

Mfrs. List No.	Order Code	1+	5+	10+
S3D2CK	160-3019●	145.62	138.51	129.61

Polarised Reflex - E3JK



- Polarised light gives reliable detection of shiny objects
- Light-on/Dark-on operation and NPN/PNP outputs selectable
- Light received indicator
- ABS plastic housing protected to IP64
- Bracket, fixings and reflector supplied

H=50, W=17.6, D=50 (without bracket), Cable L=2m

Sensing range	2m	Response time	30ms
Supply voltage	12 to 240V dc +10% 24 to 240V ac +10% 50/60Hz	Sensitivity	Fixed
Control output	Open Collector NPN / PNP 100mA @30Vdc	Temperature range	-30°C to +70°C

Mfrs. List No. E3JK-R2R3=177-895, E39-R1=177-866

212471

	Order Code	1+	5+	10+
Photoswitch	177-895●	92.39	87.77	83.16
Spare reflector	160-3054●	8.20	7.64	7.47

Diffuse, Polarised Reflex and Separate - E3JM Series



H=65, W=25, D=75

Note: Mounting bracket 179-874 allows these E3JM Series photoswitches to fit the same bracket mounting holes as obsolete E3A Series and OA5N photoswitches.

	Diffuse	Reflex	Separate
Sensing distance	700mm	4m	10m
Supply voltage	20 to 240V ac, 50/60Hz ±10% or 12 to 240V dc ±10%		
Power consumption	2W (max.)	2W (max.)	3W (max.)
Output	SPDT 3A 230VAC(max.), 5VDC(min.)		
Sensitivity	Adjustable	Fixed	Fixed
Timer version	One-shot or on-delay or off-delay adjustable 0.1 to 5s		

212473

Type	Order Code	1+	5+	10+
Diffuse	178-472●	68.93	64.12	59.65
Diffuse with timer	722-9276●	79.29	73.74	68.57
Polarised reflex	178-473●	72.99	67.88	63.13
Polarised reflex with timer	178-474●	83.99	78.12	72.66
Separate	178-475●	101.96	94.83	88.19
Spare reflector	160-3054●	8.20	7.64	7.47

Photoswitches - Optical - Omron - continued

Retroreflective Sensors

E3G-MR19 Series



- Sensing distance up to 10 m
- Operation stability monitor
- Relay output
- Mutual interference prevention function
- PBT case material
- IP67 protection
- Terminal block connection



H = 84.95, W = 29, D = 68mm

Voltage Supply	24V ac to 240V ac, 12V dc to 24V dc
Power consumption	2W
Output relay switching - Voltage (Max.)	250V ac, 30V ac
Output relay switching - Current	3A
Response time - 160-3438	30ms
Response time - 160-3439	0 to 5s
Temperature range	-25°C to +55°C

510541

Type	Mfrs. List No.	Order Code	1+	5+	10+
Retroreflective	E3G-MR19G	160-3438 ●	89.57	81.10	76.37
Retroreflective - Timed	E3G-MR19TG	160-3439 ●	89.57	81.10	76.37
Spare Reflector	E39R1	160-3054 ●	8.20	7.64	7.47

Photoswitches - Optical - Pepperl + Fuchs

Diffused



- 3 wire DC
- Yellow LED indicator
- Short circuit/overload protected
- Cabled and M8 or M12 connector versions
- Protection Degree **IP67**
- Sensing range 50 to 500mm

L: M5=35, M18=70

Wiring NPN = Normally Open
PNP = Normally Open
NPN/PROG = Programmable open or closed
PNP/PROG = Programmable open or closed

Supply Voltage 10 to 30Vdc
Output Rating 100mA
Switching frequency 250Hz
Temperature range 0 to 55°C

Sensing Distance	Output	Thread Size	Mfrs. List No.	Order Code
Prewired				
50mm	PNP	M5	KT11-50/25/103/115	372-5121
Plug in, M8 Connection 3 pin				
50mm	PNP	M5	KT11-50/25/98A/103	372-5133
Plug in, M12 Connection 4 pin				
200mm	NPN/PROG	M18	OBT200-18GM60-E4-V1	372-5327
200mm	PNP/PROG	M18	OBT200-18GM60-E5-V1	372-5339

233719

Order Code	1+	5+	10+	25+
Prewired				
372-5121	69.62	67.63	65.75	63.98
Plug in, M8 Connection 3 pin				
372-5133	70.17	68.17	66.28	64.48
Plug in, M12 Connection 4 pin				
372-5327	47.39	46.04	44.76	43.55
372-5339	45.24	43.88	42.97	42.08

Photoswitches - Optical - Datasensor

Object Detector - M18 Tubular



The S51 Series offers a very cost-effective solution for object detection in all industrial automation applications

- NPN and PNP outputs
- Standard 3 wire connection configuration
- Selectable dark or light output

Supply voltage	10 to 30V dc	Response time	1ms	
Output load	100mA	Temperature range	-25°C to +70°C	
Sensor Type		Sensing Distance	Mfrs List No.	Order Code
Axial, 2m cable				
Reflex	NPN	0.1 to 3m	S51-PA-2-A00-NK	416-4799
Reflex	PNP	0.1 to 3m	S51-PA-2-A00-PK	416-4805
Diffused Long Range	NPN	10 to 300mm	S51-PA-2-C01-NK	416-4830
Diffused Short Range	PNP	0 to 100mm	S51-PA-2-C10-PK	416-4866

248827

Type	Output	Order Code	1+	5+	10+
Axial Sensors, 2m Cable					
Reflex	NPN	416-4799	31.53	27.42	26.05
Reflex	PNP	416-4805	31.53	27.42	26.05
Diffused Long Range	NPN	416-4830	42.42	36.89	35.04
Diffused Short Range	PNP	416-4866	31.53	27.42	26.05

M18 Diffuse and Polarised Reflex - S5 Series

Prewired and M12 Plug-In



Thread=M18, Cable L=2m
731-470: L=55
731-481/731-493: L=65 (excl. cable sleeve)
Reflector supplied with reflex type

- Available AC and DC versions
- Red LED output indication
- M12 connector option (DC types only)
- DC versions have wire selectable NPN/PNP, light-on/dark-on output
- Long range version has sensitivity trimmer and green stability LED
- AC version is multi-voltage 15-264V ac with light-on output
- Plastic housing giving **IP67** protection

Photoswitches suitable for most direct sensing requirements in an industry standard M18 housing.

Sensing distance Diffuse=80mm, Diffuse adjustment=0-350mm, Polarised reflex=3000mm
Operating temperature -15°C to +55°C

	DC versions	AC version
Power supply	10 to 30V dc	15 to 264V ac, 48 to 62Hz
Output	NPN/PNP selectable	Thyristor + bridge rectifier
Output current	150mA	100mA
Response time	1ms max.	20ms max.
Mfrs. List No.	S5-5C10-30 = 731-470, S5-5B3-30 = 721-2586, S5-5B3-32 + REFLECTOR = 721-2616	S5-1C8-20 = 731-481, S5-5C35-30 = 731-493, S5-5C35-32 = 721-2604,

222150

Prewired Type	Output	Order Code	1+	5+	10+	50+
Diffuse	NPN / PNP	731-470	50.00	43.48	41.31	37.61
Diffuse	Thyristor	731-481	55.77	48.50	46.07	41.95
Diffuse, adjustable	NPN / PNP	731-493	69.71	60.62	57.59	52.44
Polarised reflex	NPN / PNP	721-2586	59.81	52.01	49.40	44.98
Plug-In Type						
Diffuse, adjustable	NPN / PNP	721-2604	77.23	67.15	63.80	58.10
Polarised reflex	NPN / PNP	721-2616	67.35	58.56	55.64	50.66

M18 Fixed Focus - S5 Series



Fixed focussed diffused

Thread=M18x70, Cable L=2m

- Available AC and DC versions
- Plastic housing giving **IP67** protection
- DC version has wire selectable NPN/PNP, light-on/dark-on output
- AC version is multi-voltage 15-264V ac with light-on output
- Red output LED indication

Modulated infra-red diffuse fixed focus sensors will detect objects up to the cut-off point 15mm from the sensor head, and will ignore objects in the background.

Sensing distance 15mm Operating temperature -15°C to +55°C

Power supply	10 to 30V dc
Current consumption	30mA Max.
Output	NPN/PNP selectable
Output current	30mA max.
Response time	1ms max.

Mfrs. List No. S5-5-D15-30 = 179-359,

212463

Voltage	Output	Order Code	1+	5+	10+
10 to 30V dc	NPN / PNP Selectable	179-359	62.13	54.02	51.32

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M18 Diffuse and Polarised Reflex - 90° Viewing S5 Series



- Available AC or DC versions
- Red LED output indication
- Plastic housing giving IP67 protection
- Viewing optics turned through 90°
- DC versions have wire selectable NPN/ PNP, light-on/dark-on output
- AC version is multi-voltage 15-264V ac with light-on output
- Long range DC version has sensitivity trimmer and green stability LED

Thread=M18x80 Cable L=2m
Reflector supplied with reflex type

Sensing distance Diffuse = 80, Diffuse adjustable = 0-300, Polarised reflex = 1500
Operating temperature -15°C to +55°C

	DC versions	AC version
Power supply	10 to 30V dc	15 to 264V, ac 48 to 62Hz
Output	NPN/PNP selectable	Thyristor + bridge rectifier
Output current	150mA max.	100mA max.
Response time	1ms max.	20ms max.
Mfrs. List No.	S5-5-C10-35 = 179-356, S5-5-C35-35 = 179-358,	S5-1-C8-25 = 179-357, S5-5B3-35 = 731-500

212462

Type	Output	Order Code	1+	5+	10+	50+
Diffuse	NPN / PNP	179-356	64.48	56.08	53.28	48.51
Diffuse	Thyristor	179-357	70.26	61.09	58.03	52.85
Diffuse, adjustment	NPN / PNP	179-358	84.15	73.18	69.51	63.29
Polarised reflex	NPN / PNP	731-500	74.32	64.63	61.39	55.89

M18 Diffuse and Polarised Reflex - S18M Series Metal Housing, Prewired and M12 Plug-In



- Wire selectable NPN/PNP, light-on/dark-on output
- Metal housing protected to IP67
- 100mm diffuse type available prewired or with 4-way M12 connector
- Sensitivity adjustment trimmer on 300mm diffuse and reflex types
- Polarised reflex type suitable for detection of shiny objects
- Output indication by yellow LED

L (body + LEDs) = 67 (diffuse),
77 (diff. adj.), 80 (reflex),
74 (diff. plug-in). Thread = M18 x 1,
Cable L=2m, Reflector dia.=75

Sensing distance Diffuse = 100, Diffuse, adjustable = 300, Po-
larised reflex = 2m (using R5 reflector)
Power supply 10 - 30V dc
Output current 200mA (with short-circuit protection)
Response time Diffuse type = 1ms, Reflex type = 2ms
Light source Diffuse = infra-red, Reflex = red

Mfrs. List No. S18M-5-K-30=724-8490, S18M-5-C-30=724-8507, S18M-5-B-30=724-8519,
S18M-5-K-32=724-8520, R5=724-8532,

222177

	Order Code	1+	5+	10+	50+
Prewired					
Diffuse	724-8490	40.89	35.55	33.78	30.76
Diffuse, adjustable	724-8507	52.71	45.84	43.54	39.65
Polarised reflex, adjustable	724-8519	48.16	41.87	39.79	36.23
Plug-In					
Diffuse	724-8520	34.63	30.11	28.61	26.05
Reflector	724-8532	11.84	10.30	9.79	8.92

S60 Series Optical Sensors



- Standard 50 x 50 x 15 compact housing
- Complete range of optic functions, basic, advanced and laser class 1
- Models with coaxial optics for polarised retroreflex contrast and luminescence sensors
- Trimmer or touch to teach setting
- M12 connection with PNP configuration

Supply voltage 12 - 24 Vdc
Output load 100mA
Response time 100µs
Temperature range -25°C to +55°C

Sensor Type Reflex, Transparent
Sensing Distance 0 to 2m
Setting Type Trimmer
Mfrs. List No. S60-PA-5-T51-PP
Order Code 410-1236

For suitable reflectors SEE PAGE 580

248812

Type	Order Code	1+	5+	10+
Reflex, Transparent	410-1236	74.05	64.39	61.16

Diffuse, Reflex and Polarised Reflex S6 Series



H=50, W=18, D=50mm
Cable L=2m

- Multi-voltage supply 16 to 264V ac/dc
- Adjustable sensitivity
- Diffused 90cm and 200cm
- Reflex 0.1M to 6M
- Polarised reflex 0.1M to 5M with R2 reflector
- LED indication of output status
- Relay output version
- Compact ABS housing with min IP65 protection
- Light-on/Dark-on selectable
- Polarised reflex gives reliable detection of shiny objects
- Reflector included with reflex & polarised retroreflex versions

Compact photoelectric sensors suitable for most conveyor systems and automation machinery, available as reflex or diffused types using infra red light or as polarised reflex type using red light.

Sensing range
Diffuse 900mm
Reflex 0.1 to 6m
Polarised reflex 0.1 to 5m
Supply voltage 15 to 264V ac/dc
Current consumption 35mA max.
Output SPCO Relay 3A @ 275V ac / 30V dc Resistive
Response time 30ms max.
Operating temperature -15°C to +55°C

Mfrs. List No. S6-1C90 = 213-263, S6-1A6 = 213-240, S6-1B5 = 213-251,

212472

Type	Order Code	1+	5+	10+
Diffuse	213-263	71.24	61.95	58.85
Reflex	213-240	71.21	61.93	58.83
Polarised reflex	213-251	79.37	69.02	65.56

Diffuse, Reflex, Polarised Reflex and Separate S2 Series



- Multi-voltage supply 16 to 264V ac/dc
- Time delay 0.6 to 16 seconds
- Relay output
- LED indication of output status
- Sensitivity trimmer standard on all models
- Dark / light selectable
- Rugged plastic housing with min IP66 protection
- Terminal block connection
- Bracket & R2 reflector included (with reflex & polarised reflex)

H=58.5, W=26, D=92.5mm

Sensing Distance Diffused 900mm, Reflex 5m, Separate 10m, Polarised reflex 3.5m
Supply Voltage 15 to 264 Vac
Current Consumption 4 VA
Output Rating SPNO relay 1A @ 250 Vac, 2A @ 30 Vdc
Response Time 20ms max
Timing Functions Normal, ON Delay, OFF Delay, ON/OFF Delay, One Shot Delay, Selectable by rotary switch
Delay with Timer Versions Adjustable 0.1 to 16s
Temperature Range -25°C to 55°C

249627

Type	Mfrs. List No.	Order Code	1+	5+	10+
Diffuse	S2-1-C90	177-903	77.05	67.00	63.65
Reflex	S2-1-A5	177-900	77.05	67.00	63.65
Reflex with Timer	S2-1-A5-T	177-901	89.05	77.44	73.56
Separate	S2-1-F10/S2-1-G10	177-908	101.96	88.66	84.22

Multivoltage Photoelectric Sensor S30 Series with Terminal Block Connection



High performance photocell particularly suited for use in harsh environments, for example, conveyor systems and palletising equipment.

- Multi-voltage supply 16 to 264V ac/dc
- Time delay 0.02 to 12 seconds
- SPDT relay output
- LED indication of output status
- Sensitivity trimmer standard on all models
- Dark / light selectable
- Rugged plastic housing with min IP67 protection
- Terminal block connection
- Bracket included with all models
- R2 reflector included with polarised reflex version

H=103 (inc. connector), W=32, D=73, (Bracket supplied, all types; Reflector supplied with reflex types)



Photoswitches - Optical - Datasensor - continued

Multivoltage Photoelectric Sensor - continued

S30 Series with Terminal Block Connection - continued

Sensing distance	2m	Output	SPCO Relay 3A @ 240Vac
Diffused		Response time	20ms
Polarised reflex	8m	Temperature range	-25°C to +55°C
Separate		Timer functions	Normal, on-delay, off-delay
Background suppression	0.2-1.1m	on/off delay, one shot	
Supply voltage	17 to 264V ac/dc	Timer range	0.02 to 2s, 0.2 to 12s
Current consumption			
Mfrs. List No.	S30-1-B8-1 = 731-547, S30-1-C200T-1 = 731-535,	S30-1-C200-1 = 731-523.	

212233

	Order Code	1+	5+	10+
Diffuse	731-523	104.50	90.87	86.32
Diffuse with timer	731-535	120.29	104.59	99.37
Polarised reflex	731-547	104.50	90.87	86.32

Reflectors



- High efficiency models for long operating distances
- Microprism reflectors (R7R8) for laser sensors

- Work with infrared and visible red emission sensors
- Suitable for reflex or polarised reflex sensors

248823

	Order Code	1+	5+	10+
Prismatic				
47 x 47mm	410-1285	9.53	8.30	7.88
36 x 55mm	410-1297	9.53	8.30	7.88
Microprism				
38 x 40mm	410-1303	22.42	19.49	18.52
9.7 x 19mm	410-1315	12.49	10.86	10.31

Slot Sensor - SR21

Microprocessor Based



H=90 (excl. connector),
W=20, D=26 (overall), Slot
W=2, D=50

- Fully automatic touch to teach setup
- Automatically selects red or green emission
- Ideal for label edge & registration mark detection
- LED indication of output status & stability
- Transistor output PNP or NPN (selectable on the cable)
- Dark/Light selectable through teach procedure
- Rugged metal housing with min IP65 protection
- Rotatable M8 connector

Slot sensing gap	2mm
Supply voltage	10 - 30V dc, reverse polarity protected
Setting	Auto set teach button
Output current	100mA with short circuit protection
Protection	IP65
Response time	80µs
Operating temperature	0 to 55°C
Light source	721-2549: Infra-red (label detection)

212294

	Mfrs. List No.	Order Code	1+	5+	10+
Emission	SR21-IR	721-2549	125.56	109.18	103.72
Infra-red					

Photoswitches - Optical - Seeka-Takex

TAKEX

Label Sensor



H=32, W=18, D=75, Slot
D=50, Cable L=3m

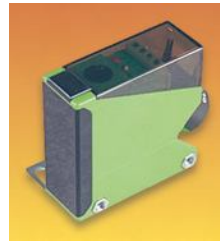
Supply voltage	12 to 24V dc ±10%	Output indication	Output = red LED Stability = green LED
Current consumption	22mA max.	Response speed	0.5ms max.
Operation mode	Light-on/Dark-on selectable	Light Source	Red LED (680nm)
Output	NPN or PNP open collector, 100mA at 30V dc max. (selectable by wiring)	Temperature range	-25°C to +55°C

212249

Mfrs. List No.	Order Code	1+	5+	10+
MCU2RTC	678-983	183.63	167.66	151.70

Diffuse with Background Suppression

DL-S Series



H=68, W=26, D=80

Sensing distance	279-950: 0.2m to 1m, 279-961: 0.2m to 2m
Supply voltage	24 to 240V ac/dc
Current consumption (max.)	AC 30mA, DC 4W
Output	SPNO Relay 3A 250V ac (750VA) max. 3A 30V dc (90W) max.
Response time	20ms (max)
Light Source	Red LED (880nm)
Temperature range	-25°C to +55°C

Mfrs. List No. DL-S100P=279-950, DL-S200P=279-961

212159

	Order Code	1+	5+	10+
Sensing Range				
200mm to 1m	279-950	166.81	152.31	137.79
200mm to 2m	279-961	166.81	152.31	137.79

Diffuse, Polarised Reflex and Separate - NA Series

Screw Terminal or M12 Plug-In Connection



- Multi-voltage supply 24-240V ac/dc, with SPNO output
- Light-on/dark-on operation is switch selectable
- Long sensing distances
- Operation indication by LED
- Polaroid reflex type for reliable detection of shiny or opaque objects
- IP66 protection
- Connection by screw terminals under sealed cover or by plug-in M12 sensor connector

H=68, W=26, D=83 (overall), Reflector (60x40) supplied with reflex type

General purpose photosensors suitable for product detection on conveyors, personnel detection for automatic doors, etc.

	Diffuse	Polarised Reflex	Separate
Sensing distance	1m (max)	0.3m to 7m	20m (max)
Supply voltage	24V to 240V ac ±10% 50/60Hz, 24V to 240V dc		
Power consumption	2W	2W	1.5W trans., 2W recr.
Output	SPNO Relay, 3A 250V ac (750VA max.) 3A 30V dc (90W max.)		
Sensitivity	Adjustable	Fixed	Fixed
Response time	10ms	10ms	10ms
Temperature range	-25°C to +55°C	-25°C to 55°C	-25°C to 55°C

Mfrs. List No. NA10=560-261, NAM7R=560-273, NAT20R=560-285, NAM7R-J=560-303

222148

	Order Code	1+	5+	10+
Screw Terminal Connection				
Diffuse	560-261	81.59	74.50	67.40
Polarised Reflex	560-273	83.72	76.45	69.16
Separate	560-285	91.70	83.73	75.75

Photoswitches - Optical - Telemecanique

Osiris

Universal Optical Proximity Switches - IP67

M18



- Metal or Plastic case
- Self teach multimode detection
- 4 modes of detection from the same sensor
- Diffuse mode range 0.3m
- Pol Reflex "reflector accessory" 2.8m
- Background suppression mode 0.12m
- Thru-Beam "with accessory" 15m
- Programmable NO/NC switching
- Pre-cabled or plug-in connector



dia. = M18, L = 64

Output
Supply voltage
Switching Capacity
Max. switching frequency
Operating temperature
Protection

PNP NO/NC
10 - 36V dc
100mA
250 Hz
-15°C to 55°C
IP67

247114

Body Type	Connection	Mfrs. List No.	Order Code	1+	5+	10+
Metal	Pre-cabled 2m	XUBOBPSNL2	425-4946	66.23	64.20	62.93
Reflector accessory						
	Reflector 50 X 50	XUZC50	541-084	10.93	10.14	9.87

Osiris

Universal Optical Proximity Switches - IP67
50 X 50 Housing format

- Self teach multimode detection
- 4 modes of detection from the same sensor
- Diffuse mode range 1m
- Pol Reflex "reflector accessory" 4m
- Background suppression mode 0.4m
- Thru-Beam "with accessory" 20m
- Programmable NO/NC switching
- Pre-cabled or plug-in connector
- Relay or solid state output

PNP	Dimensions	Connector	Body length	Relay
	H = 50	W = 18	D = 50	
Output Supply voltage Switching Capacity Max. switching frequency Operating temperature Protection				
PNP 10 - 36V dc 100mA 250 Hz -15°C to 55°C IP67				
Relay 20 - 264V 3A 30 Hz -15°C to 55°C IP 67				

247116

Body Type	Connection	Mfrs. List No.	Order Code	1+	5+	10+
Plastic	Pre-cabled 2m	XUKOAKSAL2	425-5021	73.19	70.92	69.52
Plastic	Connector	XUKOAKSAM12	425-5033	60.82	56.56	55.36
Plastic	Pre-cabled (relay output)	XUKOARCTL2	428-5426	78.31	75.89	74.39
Reflector accessory						
	Reflector 50 X 50	XUZC50	541-084	10.93	10.14	9.87

Osiris

Universal Optical Proximity Switches - IP67



- Extended sensing range
- Self teach multimode detection
- 4 modes of detection from the same sensor
- Diffuse mode range 2m
- Pol Reflex "reflector accessory" 11m
- Background suppression mode 1.3m
- Thru-Beam "with accessory" 40m
- Programmable NO/NC switching
- Quick wire terminal chamber
- Relay or solid state output

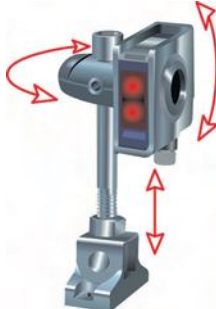
PNP or Relay
H = 91 W = 30 D = 69

Output	Relay	Relay
Supply voltage	20 - 264V	20 - 264V
Switching Capacity	3mA	3A
Max. switching frequency	250 Hz	30 Hz
Operating temperature	-15°C to 55°C	-15°C to 55°C
Time Delay		0.02-15 sec mono + 1 shot
Protection	IP67	IP67

247117

Body Type	Connection	Mfrs. List No.	Order Code	1+	5+	10+
Plastic	Terminal chamber (relay output)	XUXOARCTT16	425-5100	125.22	121.34	118.90
Reflector accessory						
	Reflector 50 X 50	XUZC80	541-096	11.00	10.18	9.89

Osiris - Osiconcept range of 3D adjustment accessories



- Fast and easy installation
- Single screw adjustment
- Precise alignment via 3D adjustment
- Fixing system compatible with all types of Osiris Photo-electrics
- Protective shrouds for heavy industry environments

247444



Price Each

Bracket with ball joint for sensors and 541084 reflector	Mfrs. List No.	Order Code	1+	5+	10+
XUZK2003	425-5148		6.97	6.48	6.37
Protective housing with ball joint					
XUZK2004	425-5173		9.40	8.75	8.56
Fixing bracket for M12 rod					
XUZ2003	425-5203		4.45	4.15	4.07
M12 rod for ball joint					
XUZ2001	425-5197		5.70	5.30	5.19

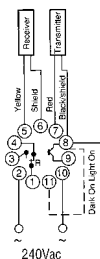
Photoswitches - Optical

Long Range - High Power Through beam



The transmitter and receiver are mounted remote from the amplifier unit which is normally installed with other electrical equipment. The amplifier is simply plugged into a standard 11 pin relay base.

Sensors: L=30, Dia=10,
Cable L=5m
Amplifier: H=76.5, W=38,
D=85 (overall)



- Infra-red transmitter/receiver combination with remote amplifier
- Operates up to 20 metres range when set to maximum sensitivity
- Alternatively can be used over a shorter range on high power
- Suitable for very dirty conditions such as car washes, lift doors, etc.
- Transmitter and receiver are sealed to IP67
- Amplifier features either relay or solid state output with optional on-delay and off-delay timer
- The sensors are supplied complete with mounting blocks

Sensors

Sensing distance	0 to 20 metres
Light source	Modulated infra-red LED
Housing	Noryl sealed to IP67 with 5 metres of cable on each device
Temperature range	-20°C to +60°C

Amplifier

Operating voltage	240V ac ±10%
Power consumption	2.8VA
Outputs	Relay - SPDT, 8A/250V ac NPN open collector 50mA/30V dc Delay on make 0 to 10s, delay on break 0 to 10s
Functions	LED indication of beam on and separate indication of relay on
Indication	Sensitivity adjustment by potentiometer
Temperature range	-20°C to +60°C

212158

	Order Code	1+	5+	10+
Transmitter	279-973	24.22	23.29	21.00
Receiver	279-985	47.89	46.92	42.29
Amplifier	279-997	83.99	82.25	74.20

Reflectors



Overall dims:
541-072: H=29, W=45, D=9,
Fixing centres=33 (Dia. 4.5)
541-084: H=69, W=55, D=8,
Fixing centres=60x35 (Dia. 4)
541-096: Dia.=84, H=10, Fixing
hole dia.=8

Reflectors for use with retroreflective (reflex) photoswitches. The 24mmx21mm and 50mm square reflectors are 'high reflection' types suitable for short sensing distances. The 80mm dia. reflector is for normal use, that is, typically at distances greater than 10% of the nominal sensing distance of the photoswitch.

212173

Reflective Area	Mfrs. List No.	Order Code	1+	10+	25+
24mm x 21mm	XUZC24	541-072	8.12	7.52	7.32
50mm square	XUZC50	541-084	10.93	10.14	9.87
80mm dia.	XUZC80	541-096	11.00	10.18	9.89

Fibre Optic Photoswitches

Miniature - WLL160



- Adjustable sensitivity
- Alarm output (forewarning of failure)
- Light/dark operation (switch selectable)
- UL Recognised and CSA approved
- Sealing to IP66
- OFF time delay (100ms switch selectable)
- Controls protected by hinged plastic cover
- Connection by either 2m integral cable or M8 screw-lock connector

H=38.5 (incl. mounting bracket)
W=12, L=59 (excl. connector)

Fibre Optic Photoswitches - continued

Miniature - WLL160 - continued

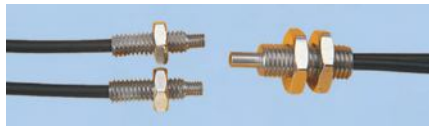
Supply voltage	10 - 30V dc	OFF time delay	100ms
Output	PNP	Operating temperature	-25°C to +55°C
Response time	350µs		

222155

Output	Mfrs. List No.	Order Code	1+	5+	10+
PNP	WLL160-F122	722-9677	85.67	82.20	80.56
PNP	WLL160-F420	730-397	95.33	93.42	91.56

Fibre Leads for WLL160 Amplifiers

SICK



Thread=M4x0.7, L=15

Thread=M6x0.75, L=20

Diffuse and through-beam fibre leads for use with Sick WLL160 amplifiers and similar. The leads have threaded sensing heads fitted and can be cut to length with the guillotine supplied.

Fibre length	2m (may be shortened)
Bending radius	25mm
Operating temperature	-40°C to +70°C

212261

	Mfrs. List No.	Order Code	1+	5+	10+
Diffused	LL3-DB01	730-403	33.78	32.42	31.77
Separate	LL3-TB01	730-415	23.64	22.00	20.47

Fibre Optic Amplifier

DATASENSOR



212-260 Thread=M6x1

212-271 Threads=M4x0.7



L = 80, Thread = M18,
Cable L = 2m

Fibre Optic Leads

Fibre optic leads to plug into fibre optic amplifier above. The diffused type is for direct detection of an object, and the separate (through-beam) type is for light barrier operation. The leads can be cut to the required length with the tool supplied.

Fibre Optic Amplifier Unit

- Sensor for small object detection or when access is difficult using conventional sensor
- Adjustable sensitivity
- Proximity detection (OF18) fibre 22mm
- Through beam detection (OF19) 85cm
- Accepts any 2.2mm diameter fibre optic cable
- LED indication of output status & stability
- Transistor output PNP or NPN (selectable on the cable)
- Dark/Light (selectable on cable)
- Rugged ABS housing with min. IP67 protection

Supply voltage	10 to 30V dc, reverse polarity protected	Temperature range	-15°C to +55°C
Output current	150mA max. with short circuit protection	Light source	Visible red LED
Setting	Trimmer	Connection	2m cable
Response time	1ms max.		

Sensing distance	13mm (diffused), 50mm (separate)	Fibre length	1m
Mfrs. List No.	S5-5-E1-30=179-361, S5-1-E1-20=179-362, OF18=212-260, OF19=212-271		

212479

Supply	Output	Order Code	1+	5+	10+
Amplifier Units					
10 to 30V dc	NPN or PNP	179-361	70.79	61.56	58.49
Fibre Optic Leads					
Diffused		212-260	32.45	28.21	26.80
Separate		212-271	35.72	31.06	29.51

Fine Tuning

E3X-NH & E3-DA-S Series

OMRON



E3X-NH Series

H=32.5, W=10, D=59
Cable L=2m



E3-DA-S Series

H = 32, W = 70, D = 10mm
L (Cable) = 2m

- High precision sensing with manual and auto tuning (teach function)
- Suitable for high precision positioning using fine sensitivity adjustment function
- Manual tuning allows threshold adjustments while sensed objects are moving
- Automatic sensitivity compensation function
- Offers longest sensing distance
- 16 bit resolution
- Mutual interference prevention
- 8-level incident and 13-level threshold indication

Supply voltage	12 to 24V dc ±10%
Light source	Red LED (680nm)
Current consumption	75mA
Output load	50mA max., NPN or PNP versions
Response time	1ms max.
Sensitivity setting	Teaching method
Fine sensitivity adjustment	Automatic or manual fine threshold adjustment
Time function (timer models)	Off-delay timer set to 40ms
Sensing distance	150mm with E32-DC200, 400mm with E32-TC200

212385

Type	Output	Mfrs. List No.	Order Code	1+	5+	10+
E3X-NH Series						
General purpose	NPN	E3X-NH11	722-9148	109.48	92.92	82.78
General purpose	PNP	E3X-NH41	722-9150	105.20	100.42	97.04
E3X-DA-S Series						
General purpose	NPN	E3XDA11S	NEW 160-3434	106.22	99.85	94.48
General purpose	PNP	E3XDA41S	NEW 160-3435	106.22	99.85	94.48

Fibre Leads

OMRON



160-3021,
Thread=M6x0.75

160-3023:
L=9, Dia.=4

160-3022, 160-3025:
Threads=M4x0.7

- Suitable for use with E3S-X3, E3X-A and E3X-NT/NM series amplifiers and similar
- Leads have threaded sensing heads
- Can be cut to required length with tool supplied
- Lens attachment greatly increases sensing distance (typically from 200mm to 1500mm using E32-TC200)
- Extra flexible multi-core fibre has 1mm bending radius with no reduction in light transmission
- Extra flexible fibre is as flexible as electric wiring, allows neater wiring

Sensing distance (min.) - Standard fibre

E3S-X3 Amplifier	Diffused 50mm, Separate 120mm
E3X-A Amplifier	Diffused 75mm, Separate 200mm
E3X-NT/NM Amplifier	Diffused 100mm, Separate 270mm

Sensing distance (min.) - Extra flexible fibre

E3X-A Amplifier	Diffused 45mm, Separate 140mm
E3X-NT Amplifier	Diffused 65mm, Separate 200mm
E3X-NM Amplifier	Diffused 60mm, Separate 180mm
Fibre length	2m cuttable to length, (dia. 2.2)
Permissible bending radius	Standard = 25mm, Extra flexible = 1mm
Temperature range	-40°C to +70°C

212205

Standard	Mfrs. List No.	Order Code	1+	5+	10+
Diffused	E32DC200	160-3021	21.69	20.19	19.27
Separate	E32TC200	160-3022	23.86	22.20	21.19
Extra flexible					
Separate	E32T11R	160-3025	52.71	48.58	46.33
Lens attachment	E39F1	160-3023	22.54	20.78	19.80

Fibre Leads - Alternative Sensor Heads

OMRON



Thread=M3x0.5, L=11; Flexible tube=0.9 dia,
L=90; Optical fibre L=2m, Dia.=1.0

160-3026

160-3027



Side view heads L=30, Dia.=6 (diffuse), 3 (separate)

Fixed focus head H=20, W=20, D=5, F.C.=6.5, Optical fibre L=2m,
Dia.=2.2

160-3028

722-9239

Fibre leads for use with Omron fibre optic amplifiers and similar.

All fibres are 2m long and may be cut to required length with tool supplied.

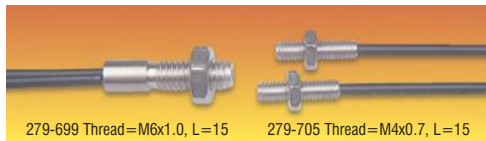
Sensing distance (with E3X-A amplifier)	E32-DC200E = 18mm, E32-TC200E = 50mm, E32-T14L = 120mm, E32-L25 = 3.3mm
Optical fibre	Black polyethylene, 25mm bending radius
Operating temperature	-40°C to +70°C

212364

Mfrs List No.	Order Code	1+	5+	10+
Small Object Sensing (M3)				
Diffuse	E32DC200E	160-3026●	26.03	24.22
Separate	E32TC200E	160-3027●	28.20	25.94
Side View, Long Distance				
Separate	E32T14L	160-3028●	72.41	67.38
			64.31	

Fibre Leads

TAKEX



Range of fibre leads for use with SEEKA-Takex® amplifiers and similar. All fibres are supplied 2 metres long and can be cut to length using the miniature guillotine supplied.

Sensing distance when used with:-	F1 Amplifier	F2 Amplifier	F10 Amplifier
279-699 (standard fibre - diffuse)	40mm	35mm	90mm
279-705 (standard fibre - separate)	100mm	80mm	230mm
Minimum bending radius (fibre)	279-699 & 279-705 = 15mm		
Minimum object resolution (best case)	279-699 = 0.03mm, 279-705 = 1.0mm		
Temperature range	-30°C to +70°C		
Fibre length	2 metres cuttable to length		

Mfrs. List No. FR5BC = 279-699, FT5BC = 279-705

212251

	Order Code	1+	5+	10+
Standard fibre - diffuse	279-699	47.88	43.71	39.55
Standard fibre - separate	279-705	50.03	45.68	41.33

Contrast Scanners

SICK

KT2G and KT5G



KT2G: H (body)=49, W=15, D (body)=41.5
KT5G: H (body)=53, W=30, D (body)=80

- Solid state light source (green LED)
- Dark-on/Light-on selectable
- Insensitive to stray light
- Diecast metal housing with IP67 protection
- Plug connection is rotatable by 90°
- KT5G light output is direction selectable (interchange lens with threaded cap)
- KT2G has adjustable sensitivity suitable for simple dark/light contrast
- KT5G has adjustable switching threshold and can distinguish up to 30 grey scale steps from black to white
- KT5G has high speed operation up to 10KHz

Supply voltage	KT2G	KT5G
Scanning distance	10 - 30V dc	10 - 30V dc
Light spot	12 - 15mm	7 - 13mm
Light source	2mm dia.	1.2 x 4.2 mm
Connection	LED, green	LED, green
Output	M12 5 Way Plug	M12 4 Way Plug
Switching frequency	NPN / PNP (Wire Selectable)	PNP
Light/dark switching	1500 Hz	10 kHz
Order Code	Wire selectable	Switch selectable
	723-4545	723-4557

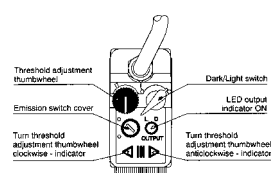
222169

Mfrs. List No.	Order Code	1+	5+	10+
KT2G-2B3711	723-4545	146.71	136.44	126.89
KT5G-2P1111	723-4557	191.11	183.39	179.72

Contrast Sensor

TL80 Analog

DATASENSOR



Control Panel

Connections:
White=NPN/PPN output Brown=10 to 30V dc
Grey=analogue output Blue=0V

H=63, W=30, D=87
Shielded cable L=3m

- 10 to 30V dc supply
- Selectable NPN/PPN output
- Dark-on/light-on switching selection
- Simple contrast threshold adjustment
- Selectable red/green LED light source
- Output status indicator LED
- Industry standard IP67 metal housing
- 3 metre cable length

High performance contrast scanner for all print registration and positioning applications.

Sensing range	9mm ±2mm	Response time	50µs
Supply voltage	10V to 30V dc	Switch frequency	10kHz
Current consumption	80mA max.	Temperature range	-10°C to +55°C
Output	NPN / PNP Selectable		

212232

Mfrs. List No.	Order Code	1+	5+	10+
TL80-011	731-584	385.11	334.88	318.14

Sensor Connectors

Tyco Electronics

M8 Connector System



- Single end terminated cable assemblies
- Straight or right angle cable entry
- Overmoulded construction offers IP67 protection
- Panel mount products for solder termination
- 5m cable length
- PVC sheath

No. Of Ways	Cable Entry	Mfrs. List No.	Order Code
Male - Single End Terminated			
3	Straight	1838286-3	141-3681
3	Straight	1838288-3	141-3682
4	Right Angle	1838290-3	141-3683
4	Right Angle	1838292-3	141-3684
Female - Single End Terminated			
3	Straight	1838282-3	141-3677
4	Straight	1838284-3	141-3678
3	Right Angle	1838296-3	141-3679
4	Right Angle	1838298-3	141-3680
Male Solder Panel Mount Terminals			
3	N/A	1838838-1	141-3704
4	N/A	1838838-2	141-3705
Female Solder Panel Mount Terminals			
3	N/A	1838839-1	141-3701
4	N/A	1838839-2	141-3702

476139

Mfrs. List No.	Order Code	1+	10+	25+	50+	100+
Male - Single End Terminated						
1838286-3	141-3681●	7.25	6.99	6.73	6.47	6.22
1838288-3	141-3682●	8.21	7.92	7.63	7.33	7.04
1838290-3	141-3683●	7.25	6.99	6.73	6.47	6.22
1838292-3	141-3684●	8.21	7.92	7.63	7.33	7.04
Female - Single End Terminated						
1838282-3	141-3677●	7.78	7.50	7.22	6.94	6.66
1838284-3	141-3678●	8.50	8.20	7.90	7.59	7.29
1838296-3	141-3679●	7.78	7.50	7.22	6.94	6.66
1838298-3	141-3680●	8.50	8.20	7.90	7.59	7.29
Male Solder Panel Mount Terminals						
1838838-1	141-3704●	5.10	4.91	4.73	4.55	4.37
1838838-2	141-3705●	5.83	5.62	5.41	5.20	4.99
Female Solder Panel Mount Terminals						
1838839-1	141-3701●	5.94	5.73	5.52	5.30	5.09
1838839-2	141-3702●	6.64	6.40	6.17	5.93	5.69

M12 Connector System

Tyco Electronics



- Single end terminated cable assemblies
- Straight or right angle cable entry with LED indication option
- Overmoulded construction offers IP67 protection

No. Of Ways	Cable Entry	Mfrs. List No.	Order Code
Male - Single End Terminated			
3	Straight	1838236-3	141-3692
4	Straight	1838238-3	141-3693
5	Straight	1838240-3	141-3694
3	Right Angle	1838248-3	141-3695
4	Right Angle	1838250-3	141-3696
5	Right Angle	1838252-3	141-3698
Female - Single End Terminated			
3	Straight	1838242-3	141-3686
4	Straight	1838244-3	141-3687
5	Straight	1838246-3	141-3688
3	Right Angle	1838254-3	141-3689
4	Right Angle	1838256-3	141-3690
5	Right Angle	1838258-3	141-3691
Female with LED Indication			
3	Right Angle	1838264-3	141-3699
4	Right Angle	1838266-3	141-3700



Sensor Connectors - continued

M12 Connector System - continued

476146

Mfrs. List No.	Order Code	1+	10+	Price Each 25+	50+	100+
Male - Single End Terminated						
1838236-3	141-3692●	7.25	6.99	6.73	6.47	6.22
1838238-3	141-3693●	8.21	7.92	7.63	7.33	7.04
1838240-3	141-3694●	9.32	8.99	8.65	8.32	7.99
1838248-3	141-3695●	7.25	6.99	6.73	6.47	6.22
1838250-3	141-3696●	8.21	7.92	7.63	7.33	7.04
1838252-3	141-3698●	9.32	8.99	8.65	8.32	7.99
Female - Single End Terminated						
1838242-3	141-3686●	7.78	7.50	7.22	6.94	6.66
1838244-3	141-3687●	8.50	8.20	7.90	7.59	7.29
1838246-3	141-3688●	9.67	9.32	8.98	8.63	8.29
1838254-3	141-3689●	7.78	7.50	7.22	6.94	6.66
1838256-3	141-3690●	8.50	8.20	7.90	7.59	7.29
1838258-3	141-3691●	9.67	9.32	8.98	8.63	8.29
Female with LED Indication						
1838264-3	141-3699●	14.47	13.96	13.44	12.92	12.41
1838266-3	141-3700●	15.70	15.14	14.57	14.01	13.45

M12 Connector System



- Field Serviceable products allow on site rewiring
- Panel mount products for solder termination

No. Of Ways	Mfrs. List No.	Order Code
M16 Thread, Double D Cutout, Hexagonal Front Flange Male Solder Terminals		
3	1838893-1	141-3709
4	1838893-2	141-3710
5	1838893-3	141-3711
Field Serviceable Connectors		
Male Metal		
3	1838275-1	141-3716
4	1838275-2	141-3717
5	1838275-3	141-3718
Female Metal		
3	1838274-1	141-3712
4	1838274-2	141-3713
5	1838274-3	141-3714

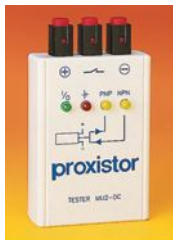
476147

Mfrs. List No.	Order Code	1+	10+	Price Each 25+	50+	100+
Male Solder Terminals						
1838893-1	141-3709●	5.10	4.91	4.73	4.55	4.37
1838893-2	141-3710●	5.94	5.73	5.52	5.30	5.09
1838893-3	141-3711●	6.64	6.40	6.17	5.93	5.69
Female Solder Terminals						
1838891-1	141-3706●	5.94	5.73	5.52	5.30	5.09
1838891-2	141-3707●	6.64	6.40	6.17	5.93	5.69
1838891-3	141-3708●	7.31	7.05	6.79	6.53	6.26
Metal Male Field Serviceable Connectors						
1838275-1	141-3716●	6.64	6.40	6.17	5.93	5.69
1838275-2	141-3717●	6.99	6.74	6.49	6.24	5.99
1838275-3	141-3718●	7.31	7.05	6.79	6.53	6.26
Metal Female Field Serviceable Connectors						
1838274-1	141-3712●	7.48	7.22	6.95	6.68	6.41
1838274-2	141-3713●	8.01	7.72	7.44	7.15	6.86
1838274-3	141-3714●	8.50	8.20	7.90	7.59	7.29

14

Proximity Switch Tester

proxistor.



- Suitable for testing 2 and 3 wire proximity switches, including inductive, photo-electric, capacitive and ultrasonic
- Ideally suited to 'point of use' testing
- Audio and visual indication
- Supplied and fitted with batteries, ready for use

H=104, W=60, D=29

Indication of proximity switch function NPN or PNP, normally closed or normally open, light-on or dark-on operation

Auto-on/off feature Unit is powered only when a proximity switch is connected

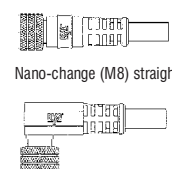
Battery DC = 2.9V (PP3)

212302

Mfrs. List No.	Order Code	1+	Price Each 5+	10+
MU2-DC	721-3803	38.74	35.84	34.61

Nano-change 3 & 4 pole, Female Connectors

BRADHARRISON



Nano-change (M8) straight

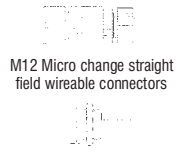
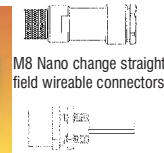
Nano-change (M8) 90°

231312

Description	Mfrs. List No.	Order Code	1+	Price Each 5+	10+
Nano-change (M8) straight					
-PVC-3pole	403000E03M020	160-6718●	5.65	5.37	5.09
-PUR-3pole	403000P03M020	160-6719●	6.27	5.97	5.64
-PVC-3pole	403000E03M050	160-6720●	6.95	6.61	6.26
-PUR-3pole	403000P03M050	160-6721●	8.36	7.95	7.53
-PVC-4pole	404000E03M020	160-6722●	6.17	5.86	5.55
-PVC-4pole	404000E03M050	160-6723●	7.87	7.47	7.09
-PUR-4pole	404000P03M050	160-6725●	9.75	9.27	8.78
Nano-change (M8) 90°					
-PVC-3pole	403001E03M020	160-6726●	5.61	5.33	5.06
-PVC-3pole	403001P03M020	160-6727●	6.27	5.97	5.64
-PUR-3pole	403001E03M050	160-6728●	6.98	6.63	6.28
-PUR-3pole	403001P03M050	160-6729●	9.59	9.12	8.63
-PVC-4pole	404001E03M020	160-6730●	6.17	5.86	5.55
-PVC-4pole	404001E03M050	160-6731●	7.87	7.47	7.09

Receptacles - M8 & M12 Threaded

BRADHARRISON



Panel mount M8 Nano change M8 mounting thread

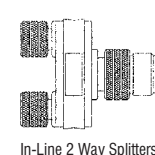
Panel mount M12 Micro change M14 mounting thread

231313

Mfrs. List No.	Order Code	1+	Price Each 5+	10+
M8 Nano change straight field wireable connectors				
Socket, M8, 3 Way	N03FA03124	160-6732●	9.57	9.09
Socket, M8, 4 Way	N04FA03124	160-6733●	10.09	9.58
Plug, M8, 3 Way	N03MA03124	160-6734●	10.25	9.74
Plug, M8, 4 Way	N04MA03124	160-6735●	11.39	10.82
M12 Micro change straight field wireable connectors				
Socket, M12, 4 Way, PG7	8A4000-315	160-6737●	5.08	4.82
Socket, M12, 4 Way, PG9	8A4000-325	160-6738●	5.30	5.03
Socket, M12, 5 Way, PG7	8A5000-315	160-6739●	6.19	5.88
Socket, M12, 5 Way, PG9	8A5000-325	160-6740●	6.40	6.08
Plug, M12, 4 Way, PG7	8A4006-315	160-6741●	5.30	5.03
Plug, M12, 4 Way, PG9	8A4006-325	160-6742●	5.30	5.03
Plug, M12, 5 Way, PG7	8A5006-315	160-6743●	5.36	5.10
Plug, M12, 5 Way, PG9	8A5006-325	160-6744●	6.05	5.75
Panel Mount M8 Micro change M8 mounting thread				
Socket, M8, 3 Way	4R3F30E02C3003	160-6745●	10.25	9.74
Panel Mount M12 Micro change M14 mounting thread				
Socket, M12, 4 way	8R4E30E03C3003	160-6746●	7.87	7.47
Socket, M12, 5 Way	8R5E30E03C3003	160-6747●	8.88	8.44
Plug, M12, 4 Way	8R4E36E03C3003	160-6749●	8.20	7.79
Plug, M12, 5 Way	8R5E36E03C3003	160-6751●	9.24	8.77

Adaptors and In-Line Splitters

BRADHARRISON



In-Line 2 Way Splitters

M8 Female to M12 Male Adaptor

231315

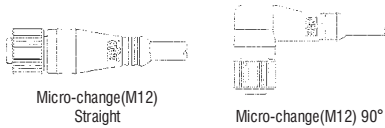
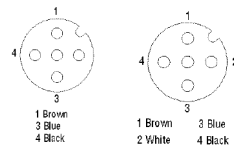
No. of Poles	Mfrs. List No.	Order Code	1+	Price Each 5+	10+
M8 Female to M12 Male Adaptor					
3 Way	483030	160-6752●	8.02	7.61	7.22
4 Way	484030	160-6753●	9.05	8.60	8.15
In-line 2 Way Splitters					
M12 - 4 Way	81590	160-6754●	10.04	9.54	9.04
M12 - 5 Way	885A30	160-6755●	29.32	27.85	26.39

Farnell



M12 with Flying Leads

Micro-change Connectors



231317

Mfrs. List No.	Order Code	1+	Price Each	5+	10+
Micro-change (M12) straight					
-3pole -PVC	803000E03M020	160-6756●	5.82	5.53	5.24
-3pole -PVC	803000E03M050	160-6757●	7.15	6.79	6.43
-4pole -PVC	804000E03M020	160-6758●	5.99	5.68	5.38
-4pole -PVC	804000P03M020	160-6759●	6.87	6.54	6.19
-4pole -PUR	804000E03M050	160-6760●	6.40	6.08	5.76
-4pole -PUR	804000P03M050	160-6762●	8.20	7.79	7.38
Micro-change (M12) 90°					
-3pole -PVC	803001E03M020	160-6763●	5.82	5.53	5.24
-3pole -PVC	803001P03M020	160-6764●	6.65	6.31	5.99
-3pole -PUR	803001E03M050	160-6765●	7.15	6.79	6.43
-3pole -PUR	803001P03M050	160-6766●	8.94	8.50	8.06
-4pole -PVC	804001E03M020	160-6767●	5.99	5.68	5.38
-4pole -PVC	804001P03M020	160-6768●	6.87	6.54	6.19
-4pole -PUR	804001E03M050	160-6769●	6.40	6.08	5.76
-4pole -PUR	804001P03M050	160-6770●	8.20	7.79	7.38

Signal Adaptor

BOS S Series



Dia. = 20mm, L = 60mm (O/A),
48mm (Body)

These signal adaptors provide quick and versatile modifications, retrofits and enhancements to sensor functionality. The converter models will change either an PNP input to a NPN output or an NPN input to a PNP output and can be programmed from normally open or normally closed outputs. The timer model can add an on-delay or off-delay up to 65535 seconds to any dc sensor. The products are designed to fit in line between M12 male and M12 female connectors, to be fitted either onto the sensor or if space is an issue can be hidden away from the hazard area.

- Red LED output indication
- Remote teach
- Short circuit protected
- M12 4-Pin female input connector, M12 4-Pin male output connector

- 12V dc to 24V dc operating voltage
- Operating temperature from 0 to 60°C
- IP67 rated for arduous environments

515458

Type	Mfrs. List No.	Order Code	1+	Price Each	5+	10+	50+
PNP to NPN Adaptor	BOS S-F01	161-2854●	78.34	74.59	70.87	63.41	
NPN to PNP Adaptor	BOS S-F02	161-2855●	78.34	74.59	70.87	63.41	
On/Off delay Timer	BOS S-T01	161-2856●	64.26	61.20	58.14	52.02	

M8 Range - Cabled, Free and Panel Connectors

PVC and PUR Cabled Plugs and Sockets



Cabled Sockets



Free Sockets and Plugs

Panel Plug and Socket

Connections: 1=brown (+), 2=white (4-core), not used (3-core), 3=blue (-), 4=black

LED indicators: green=between 1 & 3, yellow=between 4 & 3

- For use with dc proximity switches, photoswitches etc.
- Straight or right-angled connectors
- Screw-lock fixing gives vibration proof interlock with compatible connectors
- Supplied with either PVC or PUR cable
- PUR cable is immune to corrosive fluids or oils, and is more flexible than PVC
- Right-angled connectors available with LED indicators for either NPN or PNP operation
- Panel plugs and sockets are supplied complete with fixing nut
- Panel plugs and sockets have M8x0.5 thread, sealing ring and 500mm leads
- Conform to DIN/VDE 0660 part 208A2
- Colour coding of conductors to EN 50044
- Protection is IP67 to DIN 40050

RoHS ● Compliant
▲ Non-compliant



08447 11 11 11

Fax: 08447 11 11 12

585

Rating

Contact resistance
Temperature range
Casing and contact bearer
Contacts
Cable cross section

4A @60Vdc (types without LEDs)
4A @ 10-30V dc (types with LEDs)
≤6mohm
-40°C to 90°C
Polyamid 66 to UL94V-2
CuZn, Nickel Plated
0.75mm²

Mfrs. List No.

E08-CA3A1A-DF0200C1-XA500-AC=131-7876
E08-CA4A1A-DG0200C1-XA500-AC=131-7877
E08-CC3A1A-DF0200C1-XA500-AC=131-7883
E08-CC4A1A-DG0200C1-XA500-AC=131-7884
E08-CA3A1A-FL0200C1-XA500-AC=131-7882
E08-CC3A1A-FL0200C1-XA500-AC=131-7885
E08-CCAA1X-FL0200C1-XA500-AC=131-7886
E08-CA3A1A-FL0500C1-XA500-AB=131-7879
E08-CA4A1A-FM0500C1-XA500-AB=131-7881
ELKA 3008V=723-3735
ELKA 4008V=709-1450
ELWIKA 3008V=723-3747
ELWIKA 4008V=723-3759
ELST 3008V=723-3760
ELST 4008V=709-1461

212201

	Order Code	1+	10+	Price Each	25+	50+	100+
Sockets with 2 metres Cable							
PVC3- way straight	131-7876●	3.80	3.45	3.16	--	--	--
PVC4- way straight	131-7877●	4.02	3.65	3.35	--	--	--
PVC3- way r/a angle	131-7883●	3.80	3.45	3.16	--	--	--
PVC4- way r/a angle	131-7884●	4.02	3.65	3.35	--	--	--
PUR3- way straight	131-7882●	3.95	3.59	3.30	--	--	--
PUR3- way r/a angle	131-7885●	3.95	3.59	3.30	--	--	--
PVC3- way r/a angle + PNP LEDs	131-7886●	6.49	5.90	5.41	--	--	--
PUR3- way r/a angle							
Sockets with 5 metres Cable							
PUR3- way straight	131-7879●	5.53	5.02	4.61	--	--	--
PUR4- way straight	131-7881●	6.32	5.76	5.27	--	--	--
Free Sockets, Self-Assembly							
3- way straight	723-3735●	5.75	5.15	4.82	3.89	3.43	
4- way straight	709-1450	6.99	6.26	5.50	4.63	3.89	
3- way r/a angle	723-3747●	5.15	4.60	4.33	3.50	3.09	
4- way r/a angle	723-3759●	5.47	5.04	4.83	4.55	4.02	
Free plugs, Self-Assembly							
3- way straight	723-3760●	6.43	5.75	5.39	4.53	4.01	
4- way straight	709-1461	8.15	7.32	6.41	5.40	4.52	
Panel Plugs							
3- way, with nut	120-7161●	6.05	5.43	4.74	3.41	3.19	
Panel Sockets							
4- way, with nut	120-7163●	6.99	6.73	6.32	5.18	3.89	
5- way, with nut	120-7164●	7.85	7.53	7.09	5.82	4.38	

M12 Range - Cabled, Free & Panel Connectors

PVC and PUR Cabled Plugs and Sockets



Cabled Sockets and Plugs



Free Sockets and Plug

Connections: 1=brown (+),
2=white (4-core), not used
(3-core), 3=blue (-),
4=black



Panel Plug and Socket

LED indicators:
green=between 1 & 3,
yellow=between 4 & 3

- For use with dc proximity switches, photoswitches, pressure transducers, level sensors, limit switches etc.
- Sockets have screw-lock and are supplied with or without cable
- Cable available in black PVC or PUR
- PUR (polyurethane) cable is resistant to corrosive fluids or oils, and is more flexible than PVC
- Straight or right-angled connectors
- Screw-lock fixing gives vibration-proof interlock with compatible connectors
- Right-angled connectors available with LED indicators for either NPN or PNP operation
- Choice of PG7 or PG9 cable-glands on the self-assembly free plugs and sockets
- Free plugs and sockets available with either metal coupling nut or all plastic nut/thread
- Panel plugs and sockets are supplied complete with fixing nut
- Panel plugs and sockets have M12 thread, sealing ring and 200mm leads
- Conform to DIN/VDE 0660 part 208A2
- Protection is IP67 to DIN 40050
- Colour coding of conductors to EN50044

Rating	4A@150Vac/dc(types without LEDs) 4A @ 10-30V dc (types with LEDs)
Contact resistance	≤6mohm with cable, ≤3mohm without cable
Temperature range	-40°C to 90°C
Casing and contact bearer	Polyamid 66 to UL94V-2
Contacts	CuZn, Nickel Plated
Cable cross section	0.75mm ²

Sensor Connectors - continued

M12 Range - Cabled, Free & Panel Connectors - continued

PVC and PUR Cabled Plugs and Sockets - continued

Mfrs. List No.

ELKA-KV4312 PVC 034/2M.=532-617	ELST 4012 PG7=723-4028
EF124 PVC4X034L0200 50=120-7173	ELST 4012K PG7=723-4030
ELKA-KV5512PVC034/2M.=730-725	ELST 4012PG9=709-1473
ELWIKA-KV4312 PVC034/2M.=532-629	ELST 5012 PG7=120-7168
EW124 PVC4X034L0200 50=120-7174	ELWIST 4012 PG7=723-4053
ELKA-KV4312 PUR034/2M.=532-630	ELWIST 4012K PG7=723-4065
EF125 PUR5X034L0200 50=831-2826	ELWIST 5012 PG7=120-7169
ELWIKA-KV 4312 PUR034/2M.=532-642	ELKA 4012 PG7=532-095
ELWIKA-KV4312NSCPUR034/2M.=723-3917	ELKA 4012K PG7=723-3980
EF123 PVC3X034L0500 50=120-7182	ELKA 5012 PG7=120-7165
EF123 PUR3X034L0500 50=120-7184	ELWIKA 4012 PG7=532-101
EF124 PUR4X034L0500 50=120-7185	ELWIKA 4012K PG7=723-4004
ELKA-KV5512PUR034/5M.=723-3875	ELWIKA 4012PG9=709-1485
EW123 PUR3X034L0500 50=120-7186	ELWIKA 5012 PG7=120-7166
EW125 PUR5X034L0500 50=120-7187	EWM125 PUR5X034L0200 50=120-7191

212199

	Order Code	1+	10+	25+	50+
Sockets with 2 metres Cable					
PVC3- way straight	532-617	6.300	5.640	4.960	3.550
PVC4- way straight	120-7173	7.160	6.410	5.620	4.030
PVC5- way straight	730-725	8.830	7.940	6.950	4.980
PVC3- way r/angle	532-629	6.660	5.970	5.230	3.760
PVC4 Way- way r/angle	120-7174	7.160	6.410	5.620	4.030
PUR5- way straight	831-2826	5.250	4.810	4.390	--
Sockets with 5 metres Cable					
PUR3- way straight	120-7184	8.940	6.630	5.050	4.890
PUR4- way straight	120-7185	10.710	7.950	6.040	5.870
PUR5- way straight	723-3875	11.680	8.660	6.570	6.380
PUR3- way r/angle	120-7186	6.900	5.130	4.015	3.924
PUR5- way r/angle	120-7187	9.060	6.710	5.110	4.950
Plugs with 2 metres Cable					
PUR5- way r/angle	120-7191	4.520	4.100	3.350	2.657
Free Sockets, Self-Assembly					
4- way straight, PG7, metal	532-095	4.730	4.240	3.720	2.670
4- way straight, PG7, plastic	723-3980	3.330	3.030	2.900	2.790
5- way straight, PG7, metal	120-7165	5.250	5.070	4.760	3.900
4- way r/angle, PG7, metal	532-101	4.730	4.240	3.720	2.670
4- way r/angle, PG7, plastic	723-4004	3.440	3.130	3.000	2.880
4- way r/angle, PG9, metal	709-1485	4.860	4.370	3.820	3.240
5- way r/angle, PG7, metal	120-7166	5.130	4.920	4.630	3.800
Free Plugs, Self-Assembly					
4- way straight, PG7, metal	723-4028	4.730	4.550	4.280	3.510
4- way straight, PG7, plastic	723-4030	4.720	4.300	4.120	3.930
4- way straight, PG9, metal	709-1473	4.730	4.240	3.720	3.160
5- way straight, PG7, metal	120-7168	5.400	5.210	4.890	4.010
4- way r/angle, PG7, metal	723-4053	4.400	4.220	3.960	3.250
4- way r/angle, PG7, plastic	723-4065	4.930	4.500	4.310	4.090
5- way r/angle, PG7, metal	120-7169	4.040	3.880	3.650	2.990

Water-Resistive Sensor I/O Connectors



- Water-resistive smartclick connectors to help reduce installation time
- A newly developed lock structure that maintains compatibility with conventional, screw-type M12 connectors.
- Simply insert the Connectors, then turn them approximately 1/8 of a turn to lock.
- A positive click indicates locking.
- Features the same degree of protection (IP67) as conventional, screw-type M12 connectors
- Available in standard or vibration proof cabling

	Rated Voltage 250V dc	Rated Current 4A	Protection IP67	Temperature Range -25 to 70°C	
Cable Length	No. Of Ways	Connection A	Connection B	Mfrs. List No.	Order Code
1m	4 Way	M12 Male	M12 Female	XS5WD421C81A	153-8239
2m	4 Way	M12 Male	M12 Female	XS5WD421D81A	153-8241
3m	4 Way	M12 Male	M12 Female	XS5WD421E81A	153-8242
5m	4 Way	M12 Male	M12 Female	XS5WD421G81A	153-8243
10m	4 Way	M12 Male	M12 Female	XS5WD421J81A	153-8244
1m	4 Way	M12 Male	M12 Female	XS5WD421C81F	153-8245
2m	4 Way	M12 Male	M12 Female	XS5WD421D81F	153-8246
3m	4 Way	M12 Male	M12 Female	XS5WD421E81F	153-8247
5m	4 Way	M12 Male	M12 Female	XS5WD421G81F	153-8248
10m	4 Way	M12 Male	M12 Female	XS5WD421J81F	153-8249
0.3m	4 Way	M12 Male	Cable	XS5HD421A80A	153-8250
1m	4 Way	M12 Male	Cable	XS5HD421C80A	153-8252
2m	4 Way	M12 Male	Cable	XS5HD421D80A	153-8253
3m	4 Way	M12 Male	Cable	XS5HD421G80A	153-8254
5m	4 Way	M12 Male	Cable	XS5HD421J80A	153-8255
1m	4 Way	M12 Female	Cable	XS5FD421C80A	153-8256

Cable Length	No. Of Ways	Connection A	Connection B	Mfrs. List No.	Order Code
2m	4 Way	M12 Female	Cable	XS5FD421D80A	153-8257
3m	4 Way	M12 Female	Cable	XS5FD421E80A	153-8258
5m	4 Way	M12 Female	Cable	XS5FD421G80A	153-8259
10m	4 Way	M12 Female	Cable	XS5FD421J80A	153-8260
0.3m	4 Way	M12 Male	Cable	XS5HD421A80F	153-8261
1m	4 Way	M12 Male	Cable	XS5HD421C80F	153-8262
2m	4 Way	M12 Male	Cable	XS5HD421D80F	153-8264
5m	4 Way	M12 Male	Cable	XS5HD421G80F	153-8265
1m	4 Way	M12 Female	Cable	XS5FD421C80F	153-8266
2m	4 Way	M12 Female	Cable	XS5FD421D80F	153-8267
3m	4 Way	M12 Female	Cable	XS5FD421E80F	153-8268
5m	4 Way	M12 Female	Cable	XS5FD421G80F	153-8269
10m	4 Way	M12 Female	Cable	XS5FD421J80F	153-8270

499038

Mfrs. List No.	Order Code	1+	5+	10+
XS5WD421C81A	153-8239	12.22	11.61	11.00
XS5WD421D81A	153-8241	12.57	11.94	11.31
XS5WD421E81A	153-8242	13.93	13.24	12.54
XS5WD421G81A	153-8243	15.70	14.91	14.13
XS5WD421J81A	153-8244	22.09	20.99	19.88
XS5WD421C81F	153-8245	11.86	11.27	10.68
XS5WD421D81F	153-8246	13.07	12.41	11.76
XS5WD421E81F	153-8247	14.48	13.75	13.03
XS5WD421G81F	153-8248	17.28	16.42	15.55
XS5WD421J81F	153-8249	22.09	20.99	19.88
XS5HD421A80A	153-8250	7.33	6.96	6.60
XS5HD421C80A	153-8252	7.33	6.96	6.60
XS5HD421D80A	153-8253	7.65	7.26	6.88
XS5HD421G80A	153-8254	10.95	10.40	9.85
XS5HD421J80A	153-8255	19.59	18.61	17.63
XS5FD421C80A	153-8256	7.33	6.96	6.60
XS5FD421D80A	153-8257	7.33	6.96	6.60
XS5FD421E80A	153-8258	8.05	7.65	7.24
XS5FD421G80A	153-8259	12.75	12.11	11.47
XS5FD421J80A	153-8260	7.12	6.76	6.41
XS5HD421A80F	153-8261	7.33	6.96	6.60
XS5HD421C80F	153-8262	8.63	8.21	7.78
XS5HD421D80F	153-8264	11.28	10.71	10.15
XS5HD421G80F	153-8265	17.85	16.95	16.07
XS5FD421C80F	153-8266	7.33	6.96	6.60
XS5FD421D80F	153-8267	7.55	7.17	6.80
XS5FD421E80F	153-8268	9.25	8.79	8.33
XS5FD421G80F	153-8269	10.95	10.40	9.85
XS5FD421J80F	153-8270	18.37	17.45	16.54

Current Transducers

Multirange - 25/12/8/6/5A

Honeywell



723-4727& 118-7543: H=16.8, W=26, D=28
723-4739: H=20.3, W=31.8, D=12.7

- Fast response current sensing using Hall effect technology
- Multiple ranges in compact PCB mounting packages
- AC, DC and impulse current measurement
- Improved measurement accuracy at lower currents
- 25A sensor in small-footprint housings
- UL Recognised and CSA approved

Multiple primary connection pins permit a range of currents to be measured, giving a nominal output current that can be used to derive a voltage output.

Mfrs. List No.	CSNE151-005	CSNE151-100	CSNE151
Supply voltage (±5%)	±15V dc	±15V dc	±15V dc
Turns ratio	1-2-3-4-5 : 1000	1-2-3-4 : 1000	1000
Nom. primary current	25/12/8/6/5A	25/12/8/6A	25/12/8/6A
Peak current measurement	36A	90A	36A
Output current	25mA	25mA	25mA
Accuracy	±0.5%	±0.5%	±0.5%
Linearity	±0.2%	±0.2%	±0.2%
Response time	<1µs	<200ns	<1µs

Mfrs. List No. CSNE151-005=723-4727, CSNE151-100=723-4739, CSNE151 = 1187543.

212387

Nominal/Peak Current	Order Code	1+	5+	10+	25+	100+
CSNE151-005	723-4727	21.47	20.39	19.32	18.37	17.58
CSNE151-100	118-7543	20.34	19.31	18.30	17.95	17.16
CSNE151-100	118-7543	20.34	19.31	18.30	17.95	17.16

0 to 50A, 0 to 100A

Honeywell



H=29.8, W=36.5, D=14.5,
Through-hole=13.5x10
Bus-bar fixing centres=25

Supply voltage	±12 to ±5V (±5%)	Accuracy	±0.5% of nom. current @ 25°C
Linearity	±0.1%	Operating temperature	-40°C to +85°C
Response time	<500ns		

- Closed loop current sensors using Hall effect technology
- AC, DC and impulse current measurement
- Fast response time
- Range of measurement ranges up to 150A peak in small PCB mounted housing
- 50A/90A transducer available with bus-bar for use where the primary current is required on the PCB
- UL Recognised and CSA approved

Nominal Primary Current	Peak Current Range	Turns Ratio	Current Output	Offset Current	Mftrs. List No.		
50A	90A	1000	50mA	±0.20mA	CSNP661 (-002)		
100A	150A	1000	100mA	±0.20mA	CSNF161		
10A	10A	1000	100mA	±0.20mA	CSNF661		
Mftrs. List Nos:	CSNP661 = 723-4752		CSNP661-002 = 723-4764				
	CSNF161 = 723-4788		CSNF661 = 118-7544				
212386							
Nominal/Peak Current DC	Order Code	1+	5+	Price Each	10+	25+	100+
50A/90A	723-4752	19.94	18.93	17.95	17.05	16.32	
50A/90A with bus-bar	723-4764	21.94	20.84	19.73	18.77	17.95	
100A/150A	723-4788	27.63	26.25	24.86	23.62	22.58	
150A/150A	118-7544●	13.33	12.83	12.36	11.90	11.04	

CSLA2CD Linear Current Sensor



Honeywell

- Linear output
- AC or DC current sensing
- Through-hole design
- Fast response time
- Output voltage isolation from input
- Minimum energy dissipation
- Maximum current limited only by conductor size
- Adjustable performance and built-in temperature compensation assures reliable operation
- Accurate, low cost sensing
- Operating temperature range -25 to 85°C
- PBT polyester housing

Sensor Type	Open Loop Linear	Supply Current (Max. @ 25°C)	20mA
Package Style	PCB Bottom Mount	Offset Voltage	Vcc/2 ± 2%
Supply Voltage	5.4 to 13.2V dc	Offset Shift	± 0.02
Sensed Current Range	0 to 72A	Response Time	3µs
Output Type	Voltage	Mounting	PCB on 3 Pins
Operating Temperature	-25 to 85°C	Pinout Style	3 Pin
Sensitivity	32.7mV N ± 3.0 @ 8V dc		

419648

Mfrs. List No.	Order Code	1+	5+	10+	25+	+
CSLA2CD	108-2269	11.40	10.60	8.37	8.16	--

0-8A to 0-25A, LTS Series

LEM



- Development Kit contains three transducers with PCB mounts
- Unique ASIC design
- Improved linearity
- Excellent accuracy
- Extended measuring range
- Unipolar supply
- Voltage output

Output voltage @ I _{PN}	2.5V ± 0.625V	Thermal drift if gain TC _{EG}	Typically <50ppm
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212409

Nominal Peak/Power Current Range	Supply/Mfrs. List No.	Order Code	1+	5+	10+
15/45A	+5V LTS 15-NP PRESENTATION KIT	161-7407	34.35	33.32	32.32
	+5V LTS 15-NP	161-7409	8.22	7.98	7.74
	+5V LTS 25-NP KIT	161-7408	34.35	33.32	32.32
25/80A	+5V LTS 25-NP	161-7410	8.22	7.98	7.74

0-3A to 0-20A, HX P/SP2Series

LEM



- Galvanic isolation between primary and secondary circuit
- Hall effect measuring principle
- Isolation voltage 3000V
- Low power consumption
- Extended measuring range (3 x I_{PN})
- Single Supply from +12V to +15V
- Material according to UL94-V0

5 WARRANTY YEARS

H = 20, W = 19, D = 15.4mm

Output voltage	±0.625V @ I _{PN} , R _L = 2kΩ
Output impedance	≤50 Ω
Supply voltage	+12 to +15V
Current consumption	≤15mA

249454

Current Primary	Mfrs. Measuring List No.	Order Code	1+	5+	10+	25+
3	±9 A HX 03-P/SP2	161-7419	7.82	7.59	7.35	7.14
5	±15 A HX 05-P/SP2	161-7420	7.82	7.59	7.35	7.14
10	±30 A HX 10-P/SP2	161-7421	7.82	7.59	7.35	7.14
15	±45 A HX 15-P/SP2	161-7422	7.82	7.59	7.35	7.14
20	±60 A HX 20-P/SP2	161-7423	7.82	7.59	7.35	7.14

0-5A to 0-10A, HX NP Series



- Galvanic isolation between primary and secondary circuit
- Hall effect measuring principle
- 2 isolated primary windings
- Isolation voltage 3000V
- Low power consumption
- Extended measuring range (3 x I_{PN})
- Power Supply from ±12V to ±15V
- Material according to UL94-V0

H = 20, W = 19, D = 15.4mm

LEM

5 WARRANTY YEARS

Primary Current, I _{PN} Series	Parallel	Primary Current, Measuring Range Series	Parallel	Mfrs. List No.	Order Code
±5A	±10A	±15A	±30A	HX 05-NP	161-7425
±10A	±20A	±30A	±60A	HX 10-NP	161-7426
Output voltage	±4V @ I _{PN} , R _L = 10kΩ				
Output impedance	>50 Ω				
Supply voltage	±15 V				
Current consumption	> ±20mA				

249552

Current Range	Order Code	1+	5+	10+	25+	50+
5/15A	161-7425	7.82	7.59	7.35	7.14	6.92
10/30A	161-7426	7.82	7.59	7.35	7.14	6.92

5A to 50A, Low Currents HXS Series

LEM



H = 10, W = 16.5, D = 18.5mm

5 WARRANTY YEARS

These transducers have been specifically designed for the measurement of a wide range of current types including dc, ac, pulsed, and mixed. The devices have a galvanic isolation between the primary (high power) circuit and the secondary (electronic) circuit. For the complete HXS range, the fastening & connection of the secondary is by means of four 0.5 x 0.25mm pins.

The **HXS 10-NP/SP3** has the option of selecting Serial or Parallel primary connections by utilising the four 1.3mm fastening & connection pins.

The **HXS 20** range have 8 x 1.3mm primary & connection pins that enable the selection of 1, 2 or 4 primary turns.

- Hall effect measuring principle
- Multi-range current transducer
- Galvanic isolation between primary and secondary
- Isolation test voltage 2.5kV
- Fixed offset and gain
- Only occupies 3.05 cm³ on PCB

Order Code	Primary Current	Serial	Parallel
Primary connections			
913-5588	10A Nom.	20A Nom.	
	30A Max.	60A Max.	
Number of Primaries	1	2	4
913-5596	20A Nom.	10A Nom.	5A Nom.
	60A Max.	30A Max.	15A Max.
913-5600	20A Nom.	10A Nom.	5A Nom.
	60A Max.	30A Max.	15A Max.
913-5618	20A Nom.	10A Nom.	5A Nom.
	60A Max.	30A Max.	15A Max.
913-5626	50A Nom.	25A Nom.	12.5A Nom.
	150A Max.	75A Max.	37.5A Max.
913-5634	50A Nom.	25A Nom.	12.5A Nom.
	150A Max.	75A Max.	37.5A Max.

Analogue output voltage @ I_b
 Analogue output voltage @ I_b = 0
 Internal Reference - Output voltage, V_{REF}
 Output impedance, R_{OUT}
 Supply voltage, V_C
 Current consumption, I_C
 Operating temperature range

V_{REF} ± (0.625V x I_(Max) / I_(Min))
 V_{REF} ± 0.0125V
 2.5V ± 0.025
 <10 Ω
 +5V ± 5%
 22mA @ V_C = 5V
 -40 to 85°C

403270

Mfrs. List No.	Order Code	1+	5+	10+	25+
HXS 10-NP/SP3	913-5588	6.38	6.00	5.86	5.74
HXS 20-NP	913-5596	6.27	5.89	5.54	5.03
HXS 20-NP/SP2	913-5600	6.78	6.29	6.16	5.56
HXS 20-NP/SP2	913-5618	6.01	5.64	5.54	5.43
HXS 50-NP	913-5626	6.11	5.74	5.48	5.03
HXS 50-NP/SP2	913-5634	6.69	6.29	6.16	6.02

Over 480,000 products online

QGO

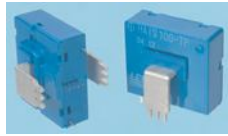


50A - 400A Rating, 150A - 600A Measuring Ranges

HAIS Series



P Models - H = 29, W = 33,
D = 14mm



TP Models - H = 29, W = 33,
D = 25.9mm



- Galvanic isolation between primary and secondary circuit
- Hall effect measuring principle
- Isolation voltage 2500V
- Low power consumption
- Fixed offset and gain
- Single +5V Power Supply

Primary Current I_{pn}	Primary Current Measuring Range	Mfrs. List No.	Order Code
50A	± 150A	HAIS 50-P	161-7433
100A	± 150A	HAIS 100-TP	161-7429
100A	± 300A	HAIS 100-P	161-7428
100A	± 300A	HAIS 100-TP	161-7429
150A	± 450A	HAIS 150-P	161-7430
200A	± 600A	HAIS 200-P	161-7431
400A	± 600A	HAIS 400-P	161-7432

Analogue output voltage @ I_b
 Analogue output voltage @ $I_b = 0$
 Internal Reference - Output voltage, V_{REF}
 Output impedance, R_{out}
 Supply voltage, V_c
 Current consumption, I_c
 Operating temperature range

$V_{REF} \pm (0.625V \times I_{(Max.)} / I_{(Min.)})$
 $V_{REF} \pm 0.0125V$
 $2.5V \pm 0.025$
 $<10 \Omega$
 $+5V \pm 5\%$
 $22mA @ V_c = 5V$
 -40 to $85^\circ C$

403271

Mfrs. List No.	Order Code	1+	5+	10+	25+
HAIS - TP Versions					
HAIS 50-TP	161-7434	13.09	12.71	12.32	11.95
HAIS 100-TP	161-7429	13.09	12.71	12.32	11.95
HAIS - T Versions					
HAIS 50-P	161-7433	12.58	12.20	11.83	11.47
HAIS 100-P	161-7428	12.58	12.20	11.83	11.47
HAIS 150-P	161-7430	12.58	12.20	11.83	11.47
HAIS 200-P	161-7431	12.58	12.20	11.83	11.47
HAIS 400-P	161-7432	12.58	12.20	11.83	11.47

200A - 800A Rating, 300A - 1200A Measuring Ranges

HTFS Series



H = 16.5, W (Dia.) = 40, D = 46mm



- Galvanic isolation between primary and secondary circuit
- Hall effect measuring principle
- Isolation voltage 2500V
- Low power consumption
- Ratio metric offset
- Single +5V power supply
- Fixing to PCB by either solder pins or 4 x M3 nuts and screws
- 22mm diameter aperture for primary conductor

Primary Current I_{pn}	Primary Current Measuring Range	Mfrs. Type
200A	± 300A	HTFS 200-P
400A	± 600A	HTFS 400-P
800A	± 1200A	HTFS 800-P

Analogue output voltage @ I_b
 Analogue output voltage @ $I_b = 0$
 Internal Reference - Output voltage, V_{REF}
 Output impedance, R_{out}
 Supply voltage, V_c
 Current consumption, I_c
 Operating temperature range

$V_{REF} \pm (0.625V \times I_{(Max.)} / I_{(Min.)})$
 $V_{REF} \pm 0.0125V$
 $2.5V \pm 0.025$
 $<10 \Omega$
 $+5V \pm 5\%$
 $22mA @ V_c = 5V$
 -40 to $105^\circ C$

403272

Mfrs. List No.	Order Code	1+	5+	10+	25+
HTFS - P Models with M3 Screw fixing to PCB					
HTFS 200-P	913-5715	11.76	11.06	10.82	10.60
HTFS 400-P	913-5731	11.76	11.06	10.82	10.60
HTFS 800-P	913-5758	12.33	11.59	11.33	11.10
HTFS - P/SP2 Models with Solder Pin fixing to PCB					
HTFS 200-P/SP2	913-5723	12.54	11.78	11.53	11.29
HTFS 400-P/SP2	913-5740	12.54	11.78	11.53	11.29
HTFS 800-P/SP2	913-5766	13.17	12.38	12.11	11.85

0-5A to 0-25A, HY...P Series



H=21, W=35, D=12

- In-line PCB pinouts
- Potted construction for maximum protection
- Minimum footprint design
- Wide choice of current ratings

Pin arrangement

1 = +15V, 2 = -15V, 3 = V_{OUT}
 4 = 0V, 5 = I_{IN} , 6 = I_{OUT}



Nominal primary current	0-5A, 0-10A, 0-15A, 0-20A, 0-25A	Power supply	±15V
Measuring range	3 nominal primary current	Output voltage	±4V
Accuracy	±1%		

212291

Norminal Primary Current	Mfrs. List No.	Order Code	1+	5+	10+	25+	50+
5A	HY 5-P	161-7399	10.82	10.49	10.18	9.87	9.58
10A	HY 10-P	161-7401	10.82	10.49	10.18	9.87	9.58
15A	HY 15-P	161-7402	10.82	10.49	10.18	9.87	9.58
20A	HY 20-P	161-7403	10.82	10.49	10.18	9.87	9.58

0-50A, LAS Series



- Cost Effective
- Utilises New ETA Technology
- High Performance
- PCB Mounting
- Tolerant of high levels of EMI
- Unipolar Voltage Supply
- Wide Frequency Bandwidth
- Extended Measuring Range
- Small Footprint
- Low Power Consumption

H = 21, W = 33.9, D = 11.53mm

Primary Nominal RMS Current	LAS 50-TP	LAS 50-TP/SP1
Power Supply	0 to 50 A	0 to 50 A
Output Voltage	5 V	5V
Accuracy	$2.5 \pm 0.625V$ ± 0.5%	$V_{ref} \pm 0.625V$ ± 0.5%

234892

Mfrs. List No.	Order Code	1+	5+	10+	25+	50+
LAS 50-TP	161-7417	13.67	13.25	12.85	12.46	12.10
LAS 50-TP/SP1	161-7418	13.67	13.25	12.85	12.46	12.10

0-50A, 0-125A, Current Output



161-7405 H=27.6, W=36.5, D=14.4 Hole=7x12.7
 161-7406 H=33.6, W=48.4, D=21.4 Hole=11x17/13
 161-7404 H= 15.1, W=15.24, D=29.2mm

- Through-hole primary
- Wide frequency range
- Fast response time



Primary Current	Mfrs. List No.	Order Code	1+	5+	10+	25+
50A	LA 55-P	161-7405	10.09	9.79	9.49	9.21
125A	LA 125-P	161-7406	18.88	18.31	17.77	17.22
Pcb Mount						
25A	LA 25-NP	161-7404	10.94	10.62	10.29	9.98

212293

0-100A, LA 100-P/SP13 Series



- Closed loop (compensated) current transducer using hall effect technology
- PCB mounted
- Insulated plastic case to UL94-V0
- Excellent accuracy
- Very good linearity
- No insertion losses
- Wide frequency bandwidth



Primary nominal r.m.s. current	100 A	Supply voltage	±12 to ±15V
Primary current, measuring range	0 to ± 160 A	Current consumption	10 mA @ ±15V + I_s
Secondary nominal r.m.s. current	100 mA	Operating temperature	-25°C to 70°C

249553

Current Range	Mfrs. List No.	Order Code	1+	5+	10+	25+
0 to 100A	LA 100-P/SP13	161-7427	12.40	12.03	11.68	11.32

0-50A to 0-400A, HAL Series



- Base-mounted package
- Wide selection of current ratings available
- Instantaneous analogue voltage output
- Compact design
- Low power consumption from auxiliary power supply
- Potted construction for maximum protection
- Output connector facility for ease of connection

H = 41. W = 41.27, D = 24.57mm

Current Rating	Measuring Range	Power Supply	Output Voltage	Mfrs. List No.	Order Code
50A	0 to ±150A	±15V	±4V	HAL 50-S	161-7411
100A	0 to ±300A	±15V	±4V	HAL 100-S	161-7413
200A	0 to ±600A	±15V	±4V	HAL 200-S	161-7414
400A	0 to ±1000A	±15V	±4V	HAL 400-S	161-7415

230495

Current Rating	Order Code	1+	5+	10+	25+	50+
50A	161-7411●	23.63	22.93	22.23	21.56	20.92
100A	161-7413●	11.63	11.27	10.93	10.61	10.28
200A	161-7414●	23.63	22.93	22.23	21.56	20.92
400A	161-7415●	25.23	24.48	23.75	23.04	22.34

Current Transducer
DC and AC Primary Input

H = 7, W = 90, D = 25mm

These transducers are designed for the measurement of DC and distorted AC waveform current. They have galvanic isolation between the primary (High power) and secondary (Electronic circuit) circuits. There is a choice of 3 output types, 0 - 5V, 0 - 10V and 4 to 20mA.

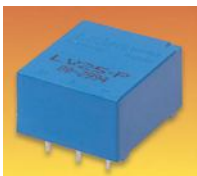


- Large aperture for cable up to 32mm Dia.
 - High isolation between primary and secondary circuits
 - Easy to mount
 - Eliminates insertion loss
- | | | | |
|---------------------|---------|-----------------------|---------------------|
| Load Resistance | ≥ 10 KΩ | Measurement Bandwidth | DC and 20 to 6000Hz |
| Supply Voltage | to 30mA | Operating Temperature | -40 to 70°C |
| Current Consumption | <±1% | Protection | IP20 |
| Accuracy | | Flammability Rating | UL94V-0 |

418017

Primary Current	Mfrs. List No.	Order Code	1+	10+	25+
5 - 0V dc analogue output signal					
200A dc/ac (rms)	DHR 200 C5	100-2690●	135.03	126.59	119.16
500A dc/ac (rms)	DHR 500 C5	100-2700●	154.29	144.64	136.14
1000A dc/ac (rms)	DHR 1000 C5	100-2707●	173.54	162.69	153.12
10 - analogue output signal					
100 A dc/ac (rms)	DHR 100 C10	100-2688●	135.03	126.59	119.16
200A dc/ac (rms)	DHR 200 C10	100-2691●	135.03	126.59	119.16
300A dc/ac (rms)	DHR 300 C10	100-2694●	154.29	144.64	136.14
400A dc/ac (rms)	DHR 400 C10	100-2698●	154.29	144.64	136.14
500A dc/ac (rms)	DHR 500 C10	100-2701●	154.29	144.64	136.14
600A dc/ac (rms)	DHR 600 C10	100-2705●	154.29	144.64	136.14
1000A dc/ac (rms)	DHR 1000 C10	100-2708●	173.54	162.69	153.12
4 - 20 mA dc analogue output signal					
100 A dc/ac (rms)	DHR 100 C420	100-2689●	135.03	126.59	119.16
200A dc/ac (rms)	DHR 200 C420	100-2692●	135.03	126.59	119.16
300A dc/ac (rms)	DHR 300 C420	100-2695●	154.29	144.64	136.14
400A dc/ac (rms)	DHR 400 C420	100-2699●	154.29	144.64	136.14
500A dc/ac (rms)	DHR 500 C420	100-2702●	154.29	144.64	136.14
600A dc/ac (rms)	DHR 600 C420	100-2706●	154.29	144.64	136.14
1000A dc/ac (rms)	DHR 1000 C420	100-2709●	173.54	162.69	153.12

Voltage Transducer

Voltage Transducer
PCB Mount

A PCB mounting voltage transducer based on the Hall effect. The unit provides galvanic isolation between primary and secondary circuits. To enable a voltage to be measured a current proportional to the measured voltage must be collected through an external resistor, selected by the user, in series with the primary circuit of the unit.



H = 15.1, W = 26, D = 29.2mm

- Suitable for the electronic measurement of voltages associated with DC, AC and impulse circuits
- Provides galvanic isolation between primary and secondary circuits
- Applications:- AC and DC voltage sensing, including power supplies, UPS, instrumentation, metering and relay systems

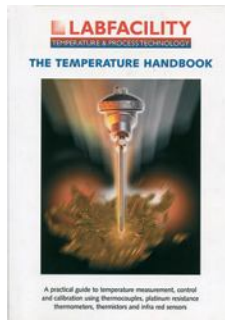
Supply voltage	± 15V (±5%)	Overall accuracy @ 25°C	± 0.6% of I _N
Input current I _N	10mA (nom.)	Isolation	2.5kV rms
Analogue output current	25mA (nom.)	Linearity	<0.2%
Turns ratio	2500 : 1000	Operating temperature	0°C to +70°C

230500

Mfrs. List No.	Order Code	1+	5+	10+	25+	50+
LV 25-P	161-7416●	31.34	30.40	29.48	28.60	27.75

Sensor Books

NEW Temperature Handbook

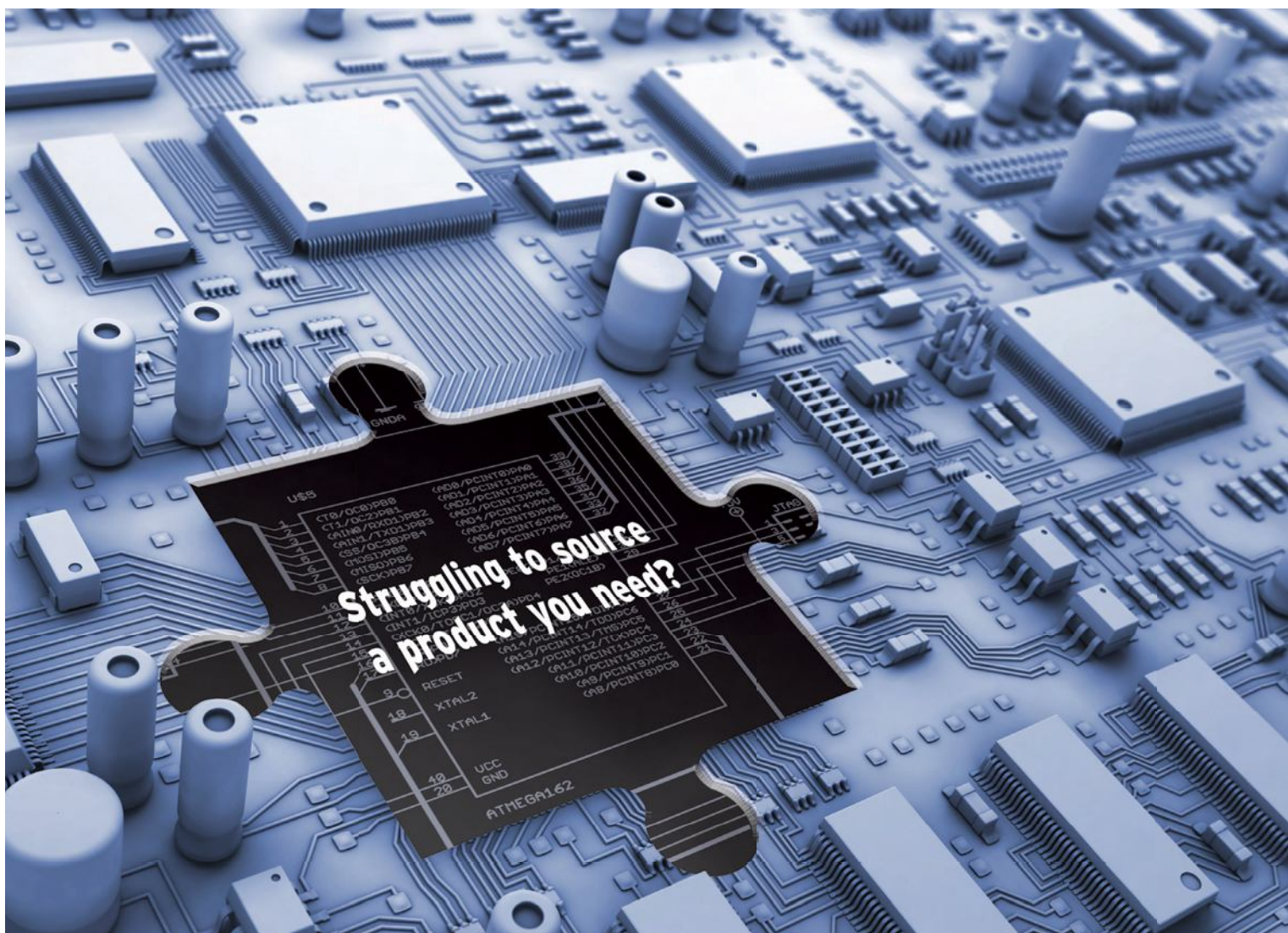


- Explains current changes in temperature technology
- Covers temperature measurement using electrical techniques
- Thermocouple and resistance thermometer theory and practice
- Reference tables and glossary of terms

386229

Mfrs. List No.	Order Code	1+	3+
IL-001	859-8088●	8.04	7.05





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