

STOP SCREWS, SENSORS, CABLES, AND HEIGHT GAUGES

SECTION 8



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	ø 3mm5
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	6mm x 6mm / ø 6.5 mm8
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Sensor reference codes

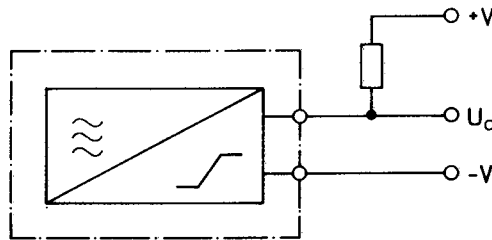
Designation	Casing form	Output technique	Switching function	Cable or connector	Status indicator	Option
XX - XXX	X	X - XX	X - X			
IR Inductive round IM Inductive quadratic QE Sensing elements RL Reflex light barrier	003 Ø 3 mm 004 Ø 4 mm 4x4 mm 005 M5 006 6 x 6 mm 065 Ø 6.5 mm 008 8 x 8 mm M8 x 1 010 Ø 10 mm 012 M12 x 1 018 M18 x 1 022 12 x 22 mm 812 8 x 12 mm 525	A Analog N NPN Output P PNP Output E Electromechanical R Controllable extern D Digital	S Normally open O Normally closed H Light on D Dark on B Normally open and Normally closed X Vacant	U2 Cable PUR 2 meter U5 Cable PUR 5 meter U9 Cable PUR 9 meter 01 Connector Meto-Fer 02 Connector Meto-Fer threaded connection 10 3-Channel connector 11 3-Channel connector threaded connection 30 4-Channel connector threaded connection	L with LED 0 without LED	A without corporate name Meto-FerElektronik AG

Cable reference codes

Designation	Connector form	Number of leads	Cable cross section	Cable and length	Status indicator
XX - XXX	-	X	X - XX	X	
ST Cable	01G Meto-Fer connector straight 02G Meto-Fer connector straight threaded connection 10G 3 Channel connector straight 10W 3 Channel connector right angle 11G 3 Channel connector straight threaded connection 11W 3 Channel connector right angle threaded connection 30G 4 Channel connector straight threaded connection 30W 4 Channel connector right angle threaded connection	2 Lead 3 Lead 4 Lead	A 0.14mm B 0.25mm	U2 Cable PUR 2 meter U5 Cable PUR 5 meter U9 Cable PUR 9 meter	X without LED

NAMUR, PNP and NPN Information

NAMUR Proximity Switch:



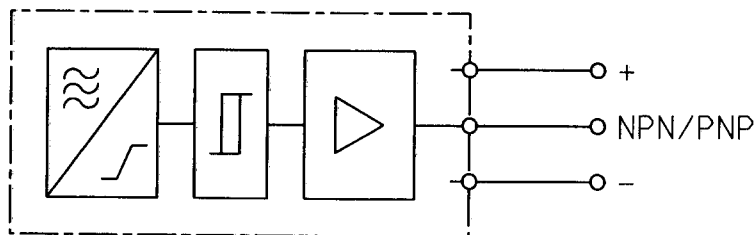
NAMUR-proximity switches have 2 wires which are connected to the supply with a current limiting resistor. The value of the limiting resistor depends on the supply voltage. According to NAMUR, the limiting resistor has a value of 1kOhm at a supply voltage of 8.2V (Temp = +20°C (+68°F)).

When the load is activated, the current consumption of the proximity switch is small; i.e. the voltage drop over the sensor element is large.

When the load is not activated, the current consumption of the proximity switch is large; i.e. the voltage drop over the sensor element is small.

Caution: A serial mounting of NAMUR proximity switches is not allowed!

LOGIC Proximity Switch:



All logic proximity switches that are alternatively available in PNP or NPN version have 3 wires.

The PNP-output signal is measured between the PNP-output wire and the negative-voltage supply-wire (blue).

The NPN-output signal is measured between the NPN-output wire and the positive-voltage supply-wire (brown).

The parallel-, as well as the serial mounting of 3-wire or 4-wire proximity switches is allowed.

The maximum number of serial mounted proximity switches varies depending on the value of the supply voltage and is limited by the value of the respective voltage drop of the elements.

Precision Stop System With Sensing Element

For monitoring mechanical motions, Meto-Fer has a patented Stop System that provides fine stroke adjustment of the stop position and simultaneously provides an output in electrical, electronic, or pneumatic form to confirm that the stop position has been met.

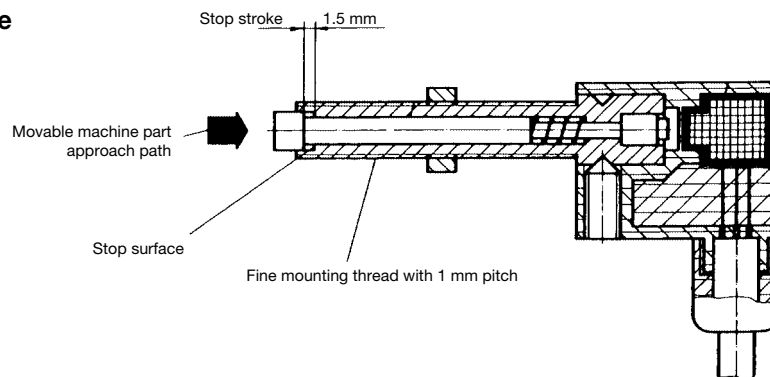
Stop screw with locknut



Plug-in sensing element



Functional Principle

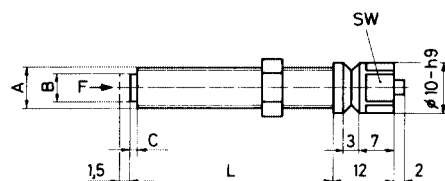


* Please note additional information on page 12 / 13

- The stop screw is used to adjust the mechanical end-position of the motion.
- The fine thread of the stop screw allows exact adjustment of the mechanical end position. The locknut secures the adjusted position.
- The stop screw contains a spring and hardened stop pin, which operates the attached sensing element when the pin is driven to the end position.
- The stroke of the hardened stop striker is 1.5 mm.
- This combination eliminates the need for a secondary sensor adjustment after the hard stop adjustment has been made.
- They come standard on all our rotary and linear actuators, or they can be integrated into your design as stand alone products whenever precision feedback and adjustment are required.

Stop Screw AS

Dimension					Part No.
A	B	C	L	LB (N)	
M8x1	5.5	1.5	15	450 (2,000 N)	AS 08/15
M8x1	5.5	1.5	40	450 (2,000 N)	AS 08/40
M10x1	7.5	2.5	50	2,135 (9,500 N)	AS 10/50
M12x1	9	2.5	60	4,600 (20,500 N)	AS 12/60
M12x1	9	2.5	80	4,600 (20,500 N)	AS 12/80
M18x1	14	2.5	100	10,100 (45,000 N)	AS 18/100
1/2-20	9	2.5	60	4,600 (20,500 N)	AS 1/2-20
5/16-24	5.5	1.5	40	450 (2,000 N)	AS 5/16-20

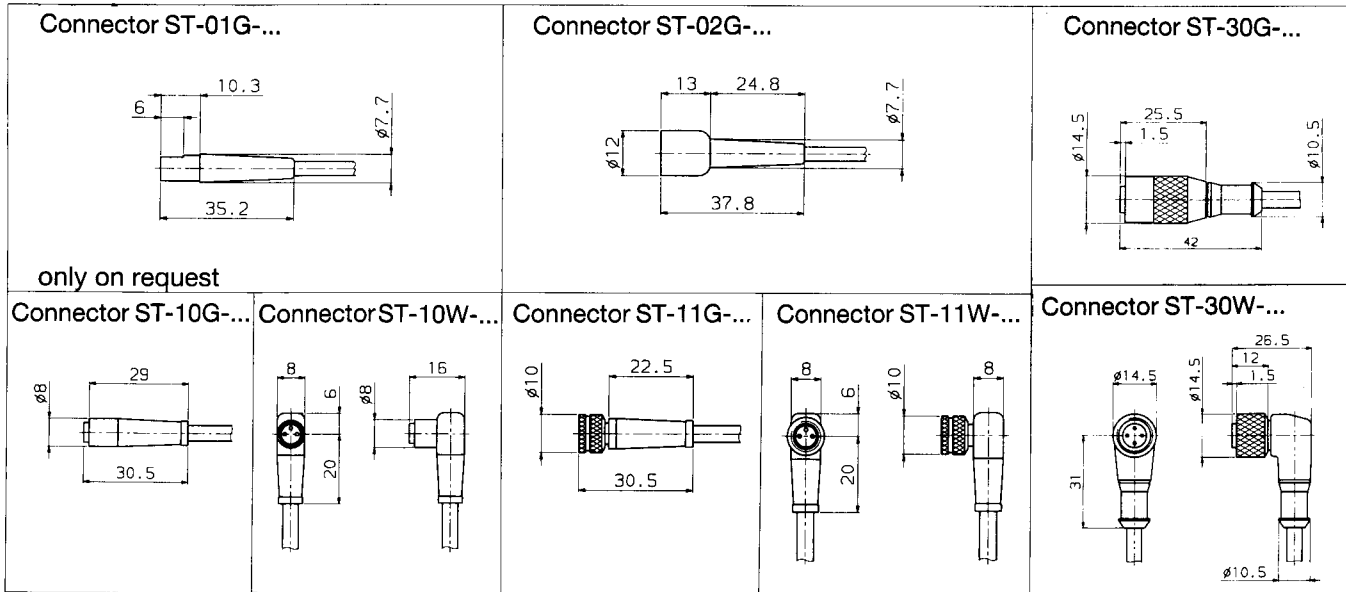


F = force or load (N) $F = m \times a$
M = mass (kg) a = acceleration (m/s)

Marking of cables and connectors

Important: Sensors and cables have to be ordered separately. All the indicated part numbers of the sensors in the catalogue which do not have an incorporated cable refer only to the sensor - the corresponding cable is not included in this part-number

The corresponding cable has to be ordered separately according the following table.



Part-Number of cables which correspond to the Meto-Fer connector 01 and 02 (cable cross section: 0.14mm²)

straight plug	
ST-02G-3A-U2X	U2X=2m
ST-02G-3A-U5X	U5X=5m
ST-02G-3A-U9X	U9X=9m

Part-Number of cables which correspond to the Standard-Connector 10 (cable cross section: 0.25mm²)

straight plug (NAMUR / LOGIC)	right angle plug (90°) (NAMUR / LOGIC)	Length
ST-10G-3B-U2X	ST-10W-3B-U2X	U2X=2m
ST-10G-3B-U5X	ST-10W-3B-U5X	U5X=5m
ST-10G-3B-U9X	ST-10W-3B-U9X	U9X=9m

Part-Number of cables which correspond to the Standard-Connector 11 (cable cross section: 0.25mm²)

straight plug (NAMUR / LOGIC)	right angle plug (90°) (NAMUR / LOGIC)	Length
ST-11G-3B-U2X	ST-11W-3B-U2X	U2X=2m
ST-11G-3B-U5X	ST-11W-3B-U5X	U5X=5m
ST-11G-3B-U9X	ST-11W-3B-U9X	U9X=9m

Part-Number of cables which correspond to the Standard-Connector 30 (cable cross section: 0.25mm²)

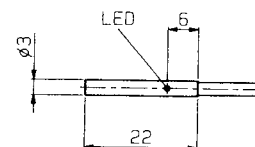
straight plug (NAMUR / LOGIC)	right angle plug (90°) (NAMUR / LOGIC)	Length
ST-30G-4B-U2X	ST-30W-4B-U2X	U2X=2m
ST-30G-4B-U5X	ST-30W-4B-U5X	U5X=5m
ST-30G-4B-U9X	ST-30W-4B-U9X	U9X=9m

- for non-contact detection of all ferrous- and non-ferrous metals
- highest precision
- smallest size
- flush mount
- easily mounted
- IP 67 system of protection
- LED status indicator

size: $\varnothing$ 3mm

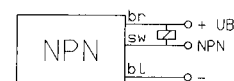
switching dist: 0.6mm

Meto-Fer sensors meet and in most cases exceed the required minimal switching distances per DIN EN 50010

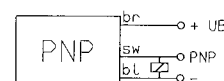
 $\varnothing$ 3mm LOGIC

wiring diagram

br = brown sw = black
bl = blue



wires are color coded according to EN 50044

**TECHNICAL DATA**

switching hysteresis	<10%
repeatability	<0.01mm
supply voltage	10V.....30V DC
residual ripple per DIN 41755	20%
load current (-10%, +25%)	100mA
current drain, activated	<10mA
current drain, not activated	<2mA
overvoltage spike protection	yes
polarity protection	yes
short circuit protection / overvoltage protection	yes
switching function	normally open
output type	NPN or PNP
LED status indicator	yes
switching rate	3 kHz
operating temperature range	-20°C.....+70°C
casing material	metal
cable cross section	0.14mm ²
cable: -standard PUR cable -special length on request	cable integral molded
system of protection per DIN 40050	IP 67
color of active surface	black

remarks to the part-number

Part Number

Reference codes see page 1

IR-003-NS-U2L
IR-003-PS-U2L

size: $\varnothing$ 4mm

switching distance: 0.8mm

size: 4mm x 4mm



switching distance: 0.8mm

$\varnothing$ 4mm NAMUR	$\varnothing$ 4mm LOGIC	4 x 4mm NAMUR	4 x 4mm LOGIC
	<10%		<10%
<0.01mm	<0.01mm	<0.01mm	<0.01mm
5V.....24 V DC	8V.....30V DC	5V.....24V DC	8V.....30V DC
10%	10%	10%	10%
	200mA		200mA
<1mA	<15mA	<1mA	<15mA
<4mA	<2mA	<4mA	<2mA
	yes		yes
	yes		yes
	yes		yes
analog	normally open	analog	normally open
Namur per DIN 19234	NPN or PNP	Namur per DIN 19234	NPN or PNP
	yes		yes
2 kHz	2 kHz	2 kHz	2 kHz
-20°C.....+70°C	-20°C.....+70°C	-20°C.....+70°C	-20°C.....+70°C
metal	metal	metal	metal
0.14mm ²	0.14mm ²	0.14mm ²	0.14mm ²
cable integral molded	cable integral molded	cable integral molded	cable integral molded
IP 67	IP 67	IP 67	IP 67
NAMUR = blue	NPN = red / PNP = green	NAMUR = blue	NPN = red / PNP = green

Part Number	Part Number	Part Number	Part Number
IR-004-AX-U20	IR-004-NS-U2L IR-004-PS-U2L	IM-004-AX-U20	IM-004-NS-U2L IM-004-PS-U2L

Reference codes see page 1

- for non-contact detection of all ferrous- and non-ferrous metals
- highest precision
- smallest size
- large switching distances
- easily mounted
- IP 67 system of protection (plug: IP 65)
- LED status indicator

size: M5 x 0.5mm



switching distance: 0.8mm

	M5 x 0.5mm NAMUR	M5 x 0.5mm LOGIC
Meto-Fer sensors meet and in most cases exceed the required minimal switching distances per DIN EN 50010		
wiring diagram br = brown sw = black we = white bl = blue wires are color coded according to EN 50044		
TECHNICAL DATA		
switching hysteresis		<10%
repeatability	<0.01mm	<0.01mm
supply voltage	5V.....24V DC	8V.....30V DC
residual ripple per DIN 41755	10%	10%
load current (-10%, +20%)		200mA
current drain, activated	<1mA	<15mA
current drain, not activated	<4mA	<2mA
overvoltage spike protection		yes
polarity protection		yes
short circuit protection / overvoltage protection		yes
switching rate	analog	normally open (NO)
output type	NAMUR per DIN 19234	NPN or PNP
LED status indicator		yes
switching rate	2 kHz	2 kHz
operating temperature range	-20°C.....+70°C	-20°C.....+70°C
casing material	metal	metal
cable cross section	0.14mm ²	0.14mm ²
cable: -PUR cable is standard -cable has to be ordered separately (page 12)	integral molded cable	integral molded cable
system of protection per DIN 40050	IP 67	IP 67
color of the active surface	NAMUR = blue	NPN = red / PNP = green

remarks to the part number	Part Number	Part Number
Reference codes see page 1	IR-005-AX-U20	IR-005-NS-U2L IR-005-PS-U2L

size: 6 x 6mm



switching distance: NAMUR 1.5mm / Logic 2mm

size: ø 6.5mm



switching distance: NAMUR 1.5mm / Logic 2mm

6 x 6mm NAMUR	6 x 6mm LOGIC	ø 6.5mm NAMUR	ø 6.5mm LOGIC
	<10%		<10%
<0.01mm	<0.01mm	<0.01mm	<0.01mm
5V.....24V DC	8V.....30V DC	5V.....24V DC	8V.....30V DC
10%	10%	10%	10%
	200mA		200mA
<1mA	<15mA	<1mA	<15mA
<4mA	<2mA	<4mA	<2mA
	yes		yes
	yes		yes
	yes		yes
analog	normally open	analog	normally open
Namur per DIN 19234	NPN or PNP	Namur per DIN 19234	NPN or PNP
			yes (plug version only)
2 kHz	2 kHz	2 kHz	2 kHz
-20°C.....+70°C	-20°C.....+70°C	-20°C.....+70°C	-20°C.....+70°C
metal	metal	metal	metal
0.14mm ²	0.14mm ²	0.14mm ²	0.14mm ²
integral molded cable	integral molded cable	integral molded cable or connector (see page 12)	integral molded cable or connector (see page 12)
IP 67	IP 67	IP 67 (with plug = IP 65)	IP 67 (with plug = IP 65)
Namur = blue	NPN = red / PNP = green	Namur = blue	NPN = red / PNP=green

Part Number	Part Number	Part Number	Part Number
IM-006-AX-U20	IM-006-NS-U2L IM-006-PS-U2L	IR-065-AX-U20 IR-065-AX-010 IR-065-AX-100	IR-065-NS-10L IR-065-PS-10L IR-065-NS-01L IR-065-PS-01L IR-065-NS-U2L IR-065-PS-U2L

Reference codes see page 1

- switching dist: NAMUR = 1.5mm / Logic = 2mm

9

size: 8 x 8mm



switching distance: NAMUR = 1.5mm / Logic = 2mm

size: M12 x 1mm



switching distance: NAMUR = 3mm / Logic = 3mm

8 x 8mm NAMUR		8 x 8mm LOGIC		M12 x 1mm NAMUR		M12 x 1mm LOGIC	
U20		U20		U20		U20	
01		01		02		02	
10		10		30		30	
		<10%				<10%	
<0.02mm		<0.02mm		<0.05mm		<0.05mm	
5V.....24VDC		8V.....30V DC		5V.....24V DC		8V.....30V DC	
10%		10%		10%		10%	
		200mA				200mA	
<1mA		<15mA		<1mA		<15mA	
<4mA		<2mA		<4mA		<2mA	
		yes				yes	
		yes				yes	
		yes				yes	
analog		normally open		analog		normally open/closed	
Namur per DIN 19234		NPN or PNP		Namur per DIN 19234		NPN or PNP	
		yes (plug version)				yes (plug version)	
1 kHz		1 kHz		1 kHz		1 kHz	
-20°C.....+70°C		-20°C.....+70°C		-20°C.....+70°C		-20°C.....+70°C	
metal		metal		metal		metal	
0.14mm²		0.14mm²		0.14mm²		0.14mm²	
integral cable or cable with connector (see page 4)		integral cable or cable with connector (see page 4)		integral cable or cable with connector (see page 4)		integral cable or cable with connector (see page 4)	
IP 67 (with plug = IP 65)		IP 67 (with plug = IP 65)		IP 67 (with plug = IP 65)		IP 65 (with plug = IP 65)	
NAMUR = blue		NPN = red / PNP = green		NAMUR = blue		NPN = red / PNP = green	

Part Number	Part Number	Part Number	Part Number
IM-008-AX-100	IM-008-NS-10L	IR-012-AX-U20	IR-012-NB-30L
IM-008-AX-010	IM-008-PS-10L	IR-012-AX-300	IR-012-PB-30L
IM-008-AX-U20	IM-008-NS-01L	IR-012-AX-020	IR-012-NS-02L
	IM-008-PS-01L		IR-012-PS-02L
	IM-008-NS-U2L		IR-012-NS-U2L
	IM-008-PS-U2L		IR-012-PS-U2L

Reference codes see page 1

- for non-contact detection of all ferrous- and non-ferrous metals
- highest precision
- large switching distances
- plug version (IP 65)
- easily mounted
- LED status indicator

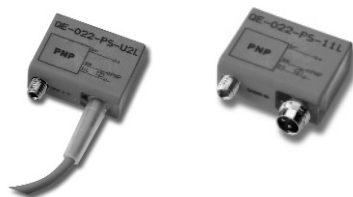
size: M18 x 1mm



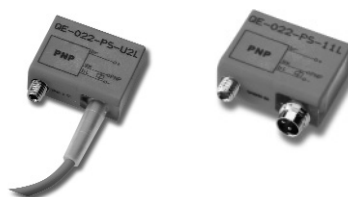
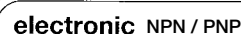
switching dist: 5mm

Meto-Fer sensors meet and in most cases exceed the required minimal switching distances per DIN EN 50010	M 18 x 1mm LOGIC	
	02	
wiring diagram br = brown sw = black we = white bl = blue wires are color coded according to EN 50044	30	
TECHNICAL DATA		
switching hysteresis	<10%	
repeatability	<0.1mm	
supply voltage	8V.....30V DC	
residual ripple DIN 41755	10%	
load current (-10%, +25%)	200mA	
current drain, activated	<15mA	
current drain, not activated	<2mA	
overvoltage spike protection	yes	
polarity protection	yes	
short circuit protection / overvoltage protection	yes	
switching function	normally open/closed	
output type	NPN or PNP	
LED status indicator	yes	
switching rate	500 Hz	
operating temperature range	-20°C.....+70°C	
casing material	metal	
cable cross section		
cable: - cable has to be ordered separately (see page 4)		
system of protection per DIN 40050	IP 65	
color of active surface (NPN = red / PNP = green)	depend on output function	
remarks to the part number	Part-Number	
Reference codes see page 1	IR-018-NB-30L IR-018-PB-30L IR-018-NS-02L IR-018-PS-02L	

- mechanically adjust stroke limit with electronic or pneumatic sensing device
- element can be plugged on
- Type ..-NS,-PS.: sense with inductive proximity switch
- Type ..-EB: electro-mech. switch
- Type P: 3/2 directional control valve



sensor for stop screw

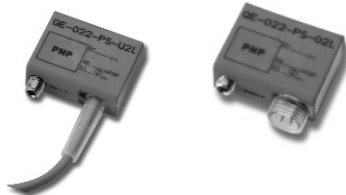


sensor for stop screw

	22 x 12mm NAMUR	22 x 12mm LOGIC
Plug on to any stop screw and secure with set screw.	 U20	 02 11
wiring diagram br = brown sw = black we = white bl = blue wires are color coded according to EN 50044		
TECHNICAL DATA		
supply voltage	5V.....24V DC	8V.....30V DC
residual ripple per DIN 41755	10%	10%
load current		200mA
current drain, activated	<1mA	<15mA
current drain, not activated	<4mA	<2mA
Max. switching current (AC and DC)		
Max. switching voltage DC		
Max. switching voltage AC		
polarity protection		yes
short circuit prot. / overvoltage prot.		yes
switching function	analog	normally open
output type	NAMUR	NPN or PNP
LED status indicator		yes
switching rate	2 kHz	2 kHz
operating temperature range	-20°C.....+70°C	-20°C.....+70°C
casing material	plastic	plastic
cable cross section	0.14mm ²	0.14mm ²
cable: -PUR cable is standard -cable info - (see page 4)	integral molded cable or cable with plug (see page 4)	integral molded cable or cable with plug (see page 4)
system of protection per DIN 40050	IP 67 (plug version = IP 65)	IP 67 (plug version = IP 65)
signal transmitter	stop screw	stop screw

remarks to the part number	Part Number	Part Number Sensor	Cable (2m.6FT)
Reference codes see page 1	QE-022-AX-110	*5m and 9m also available	
	QE-022-AX-020	QE-022-NS-11L	ST-11G-3B-U2X
	QE-022-AX-U20	QE-022-PS-11L	
		QE-022-NS-02L	ST-02G-3A-U2X
		QE-022-PS-02L	
		QE-022-NS-U2L	INTEGRAL MOLDED CABLE
		QE-022-PS-U2L	

electro-mechanical



switch for stop screw

pneumatic



valve for stop screw

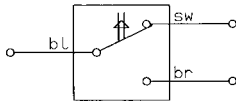
stop screw



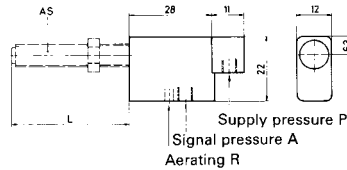
type AS

electro-mechanical

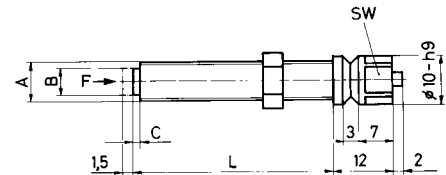
U20/02



type P = pneumatic



stop screws AS



dimensionen

Part No.

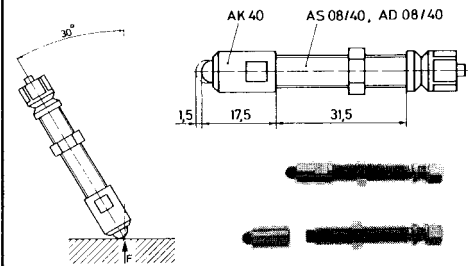
A	B	C	L	F max.	
M8x1	5.5	1.5	15	2000N	AS 08/15
M8x1	5.5	1.5	40	2000N	AS 08/40
M10x1	7.5	2.5	50	9500N	AS 10/50
M12x1	9	2.5	60	20500N	AS 12/60
M12x1	9	2.5	80	20500N	AS 12/80
M18x1	14	2.5	100	45000N	AS 18/100

F = force or load (N) $F = m \times a$

m = mass (kg)

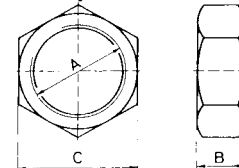
a = acceleration (m/s²)

spherical head type AK 40 for
operating the stop screw AS 08/40
at an off centre angle



Part Number: AK 40

nuts with fine-pitch thread



dimensionen

Part No.

A	B	C	
M5x0.5	2.5	8	MU 01.001
M6x0.5	2.5	8	MU 01.002
M8x1	4	10	MU 01.003
M10x1	4	13	MU 01.004
M12x1	4	15	MU 01.005
M14x1	4	16	MU 01.006
M18x1	6	22	MU 01.007

Part Number

Cable (2m.6FT)

Part Number

*5m and 9m also available

QE-022-EB-110

ST-11G-3B-U2X

QE-022-EB-020

ST-02G-3A-U2X

QE-022-EB-U20

INTEGRAL
MOLDED CABLE

P

the pneumatic element is available
in one type only

Reference codes see page 1

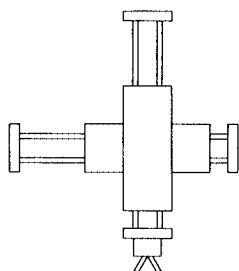
StopScrew AS (with extended stroke)

Use of the StopScrew with Extended Stroke and the QE-OSN-PS-11L Sensing Unit (see QE022-PS-11L data on page 12) enables achievement of shorter cycle times.

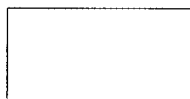
Depending on designated stroke (5, 10 or 20mm) the signal is advanced accordingly by 5, 10 or 20mm before the end stop. (The signal will be held).

Early signal compensation will be allowed for the start delay of a motion (approx. 0.1 sec.) through values and air flow.

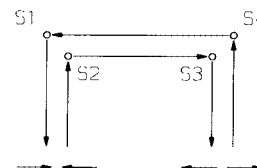
Motion Example:



Motion Curve
"AS Standard
StopScrew"

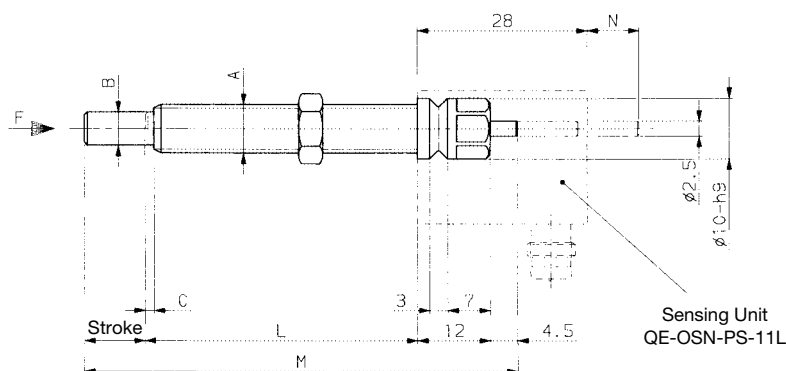


Motion Curve
"AS StopScrew with
Extended Stroke"



Example of 4 Cycle Positions
(S1, S2, S3, S4) with time savings

Time savings of approx. 0.5 sec.

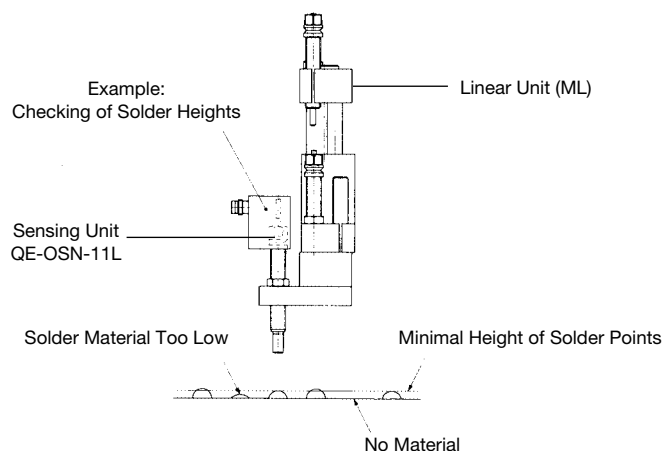


A	B	C	L	Stroke	M	N	F [N]		Order No.
							min.	max.	
M8x1	5.5	1.5	45	10	71.5	-	6	2000	AS08/45-10
M10x1	7.5	2.5	50	10	76.5	-	10	9500	AS10/50-10
M12x1	9.0	2.5	60	10	86.5	-	10	20500	AS12/60-10

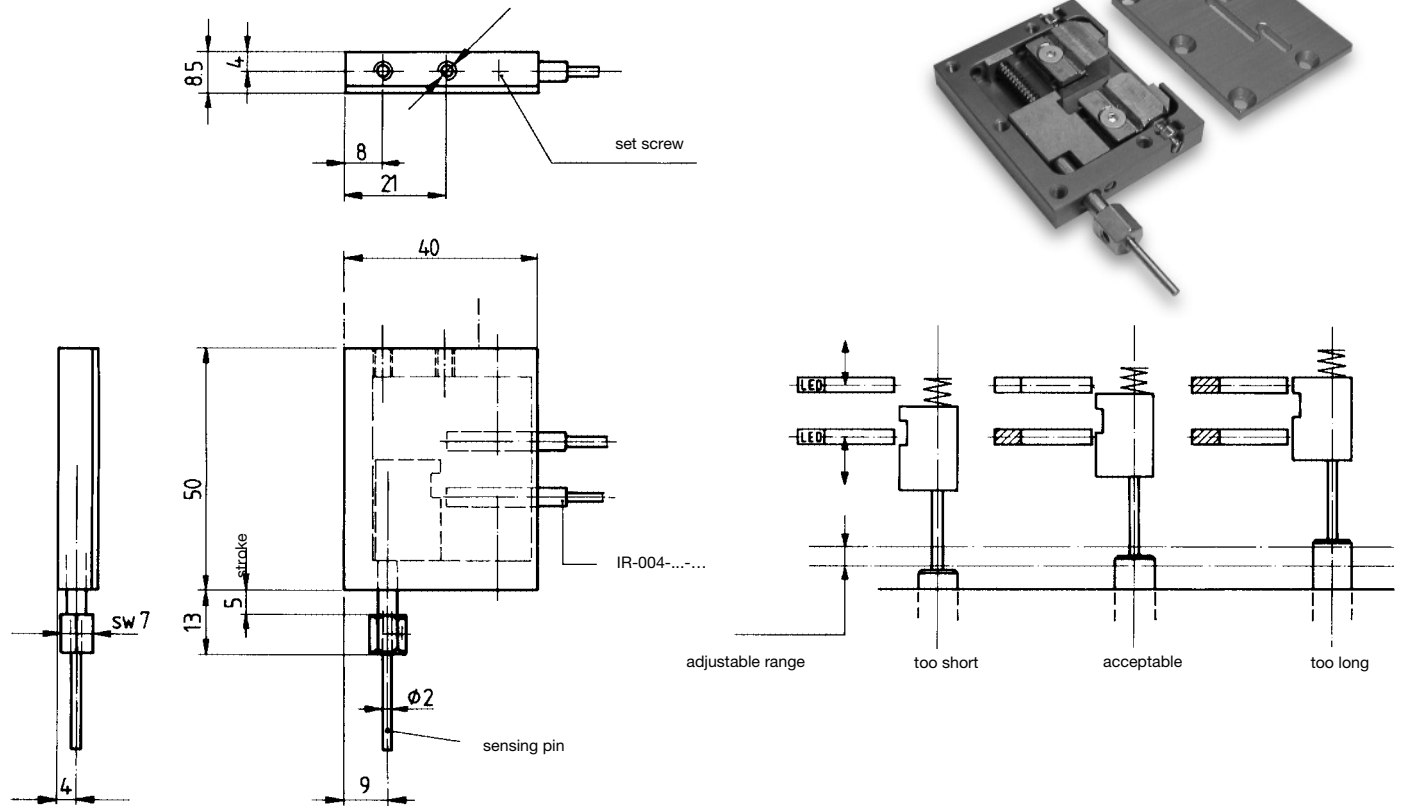
Sensing Unit



Order No:
QE-OSN-PS-11L



Height Gauge KV (precision sensing unit)



Application:

- Tolerance control with output signal for too short, acceptable, too long
- Check for failure
- Presence control

The height gauge KV is used for the control of two adjustable positions with a range from 0.03 to 5 mm.

Whenever precision feedback and adjustment are required.
Output signal; when the preset limiting values are reached.

Order No.

KV 01- ...

O-without proximity switches

A-with 2 inductive proximity switches IR-004-NS-U2L (NPN, normally open)

B-with 2 inductive proximity switches IR-004-PS-U2L (PNP, normally open)

C-with 2 inductive proximity switches IR-004-AX-U20 (NAMUR, analog)

*All proximity switches have molded cable, see page 6

Technical data:

- Control range is adjustable with two set screws (sensor position 1 and 2)
- Adjustable range: 0.03 - 5 mm (0.00118-0.196 inch)
- Spring force: 140 - 210 g (0.308-0.463 lb)
- Repeatability: +/- 0.03 mm (+/-0.00118 inch)
- Weight: 0.07 kg (0.154 lb)
- For horizontal and vertical applications