

meto - Per

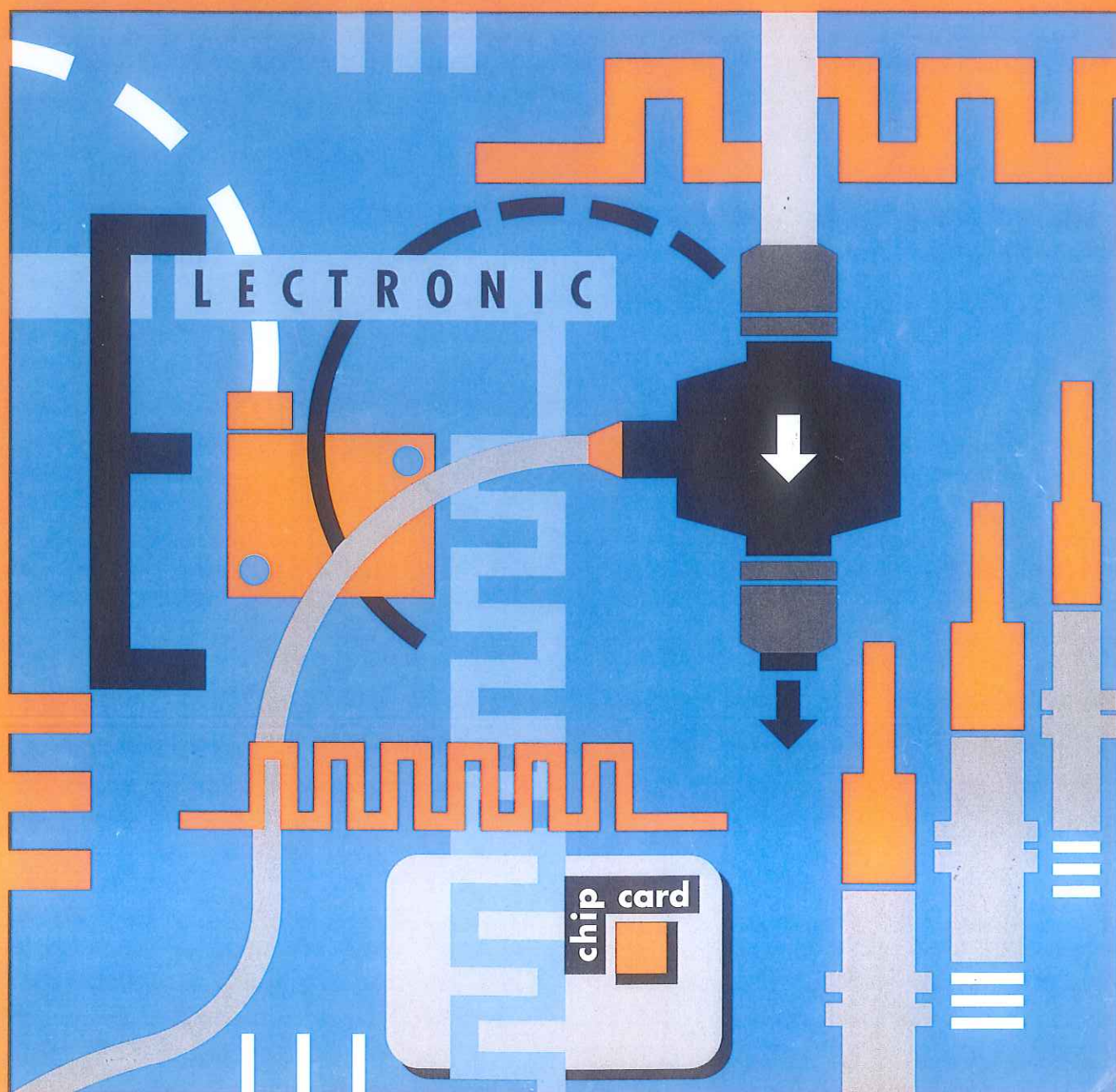
®

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Electronic Sensors



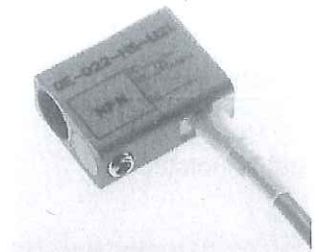
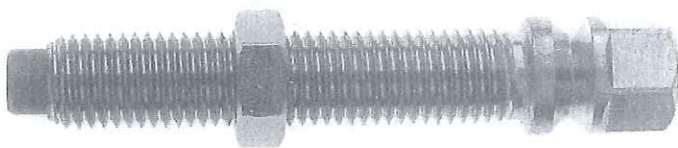
7. STOP SYSTEM WITH PLUG-IN SENSING ELEMENT

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.

The "Stop System" consists of the following 2 parts:

Stop screw with locknut

Plug-in sensing element



The stop screw is used to adjust the mechanical end-position of the motion.

The fine-mounting thread of the stop screw allows exact adjustment of the mechanical end position. The locknut secures the adjusted position.

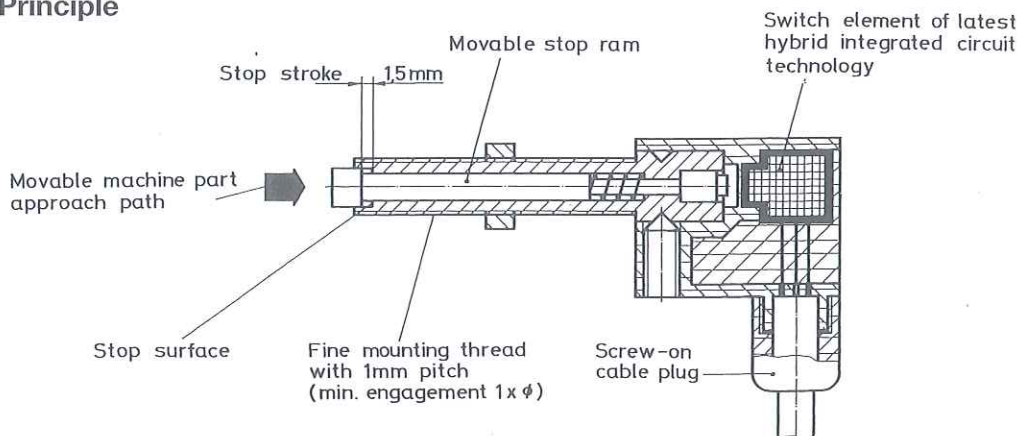
The stop screw contains a lightly sprung and hardened stop pin which operates the attached sensing element when the pin is driven to the end position.

The stroke of the hardened stop striker is 1.5mm.

After adjusting the desired end stop position, the sensing element is attached to the stop screw.

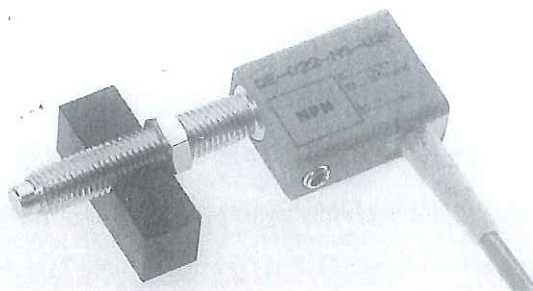
The sensing element is an electro-mechanical, electronic, or pneumatic switch which reacts to the movement of the stop pin.

Functional Principle

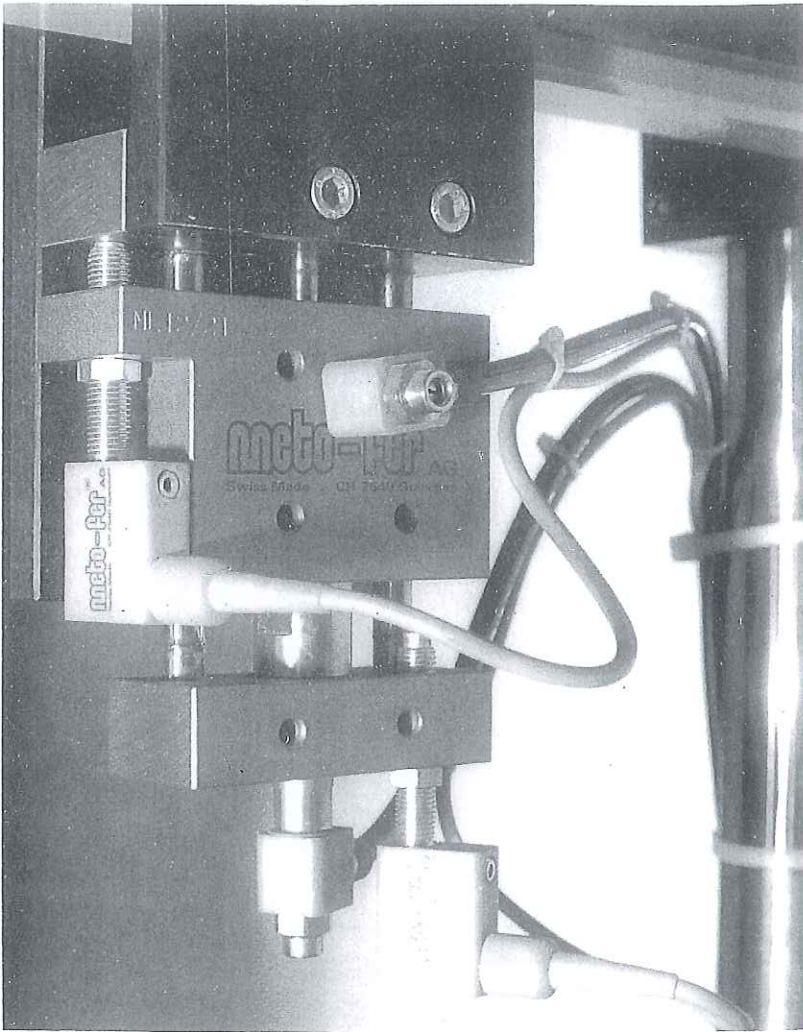


The socket head cap screw of the plug-in sensing element is used to mount the sensing element on the stop screw.

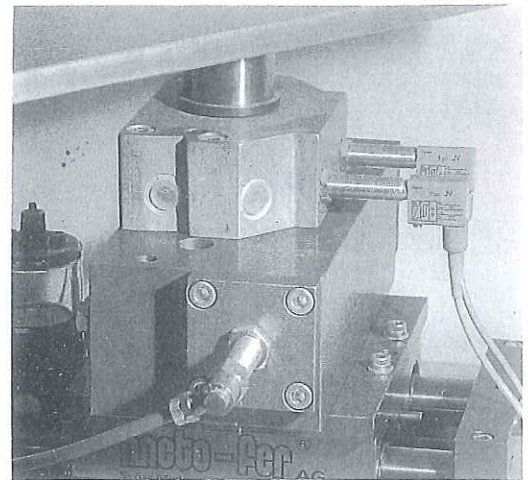
The socket head cap screw is provided with a conical end and is simultaneously used for the exact positioning of the sensing element on the stop screw.



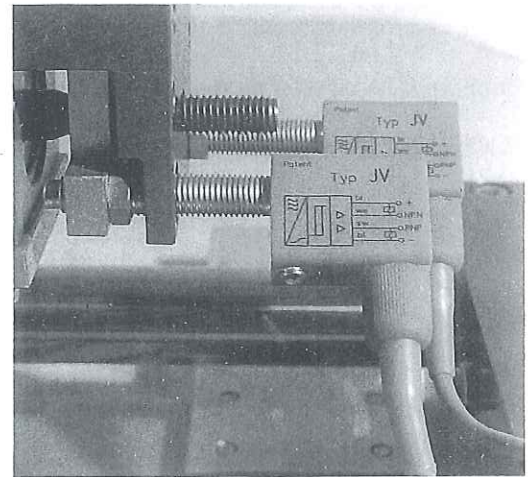
Application Examples



Vertical motion with stop system



Rotational motion with stop system
(angle rotation)



Horizontal motion with stop system

The stop system with plug-in sensing element is suited for any application requiring the installation of a mechanical stop in combination with electrical, electronic, or pneumatic monitoring possibilities.

There are 4 types of these compact sensing elements available:

- Type QE-022-EB with electro-mechanical stop switch (change-over contact)
- Type QE-022-AX with contactless inductive proximity switch per NAMUR (2-wire/analog)
- Type QE-022-PS/NS with contactless inductive proximity switch in PNP or NPN output configuration
- Type P with pneumatic 3/2 way NC-function

The sensing elements QE-022-AX and QE-022-PS/NS, as well as all other proximity switches, are manufactured in accordance with state-of-the-art-hybrid integrated circuit technology.

The stop screws are available in 6 different sizes, and they withstand forces of up to 45000N (see page 23).

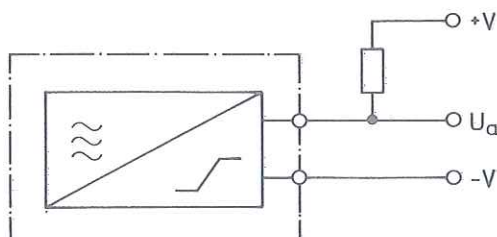
This patented stop system, with a suitable electrical or pneumatic sensor, enables a mechanical end stop in a small space.

Advantages of the combined stop system:

- low construction/design cost
- precise adjustment of the mechanical end position, with a defined position for electrical or pneumatic monitoring
- all stop screws have the same standard sensor mounting

8. CONSTRUCTION AND PROPER CONNECTION OF THE PROXIMITY SWITCHES

NAMUR Proximity Switch:



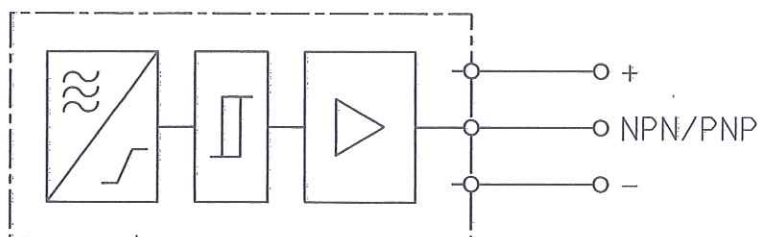
NAMUR-proximity switches have 2 wires which are connected to the supply with a current limiting resistor. The value of the limiting resistor depends on the supply voltage. According to NAMUR, the limiting resistor has a value of 1kOhm at a supply voltage of 8.2V (Temp = +20°C (+68°F)).

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.

A suitable arrangement of the wiring prevents the occurrence of interfering impulses at the output of the proximity switch. A parallel arrangement of power lines or supply lines of solenoids and relays with the wires of the proximity switch must be avoided.

9. CUSTOMIZED PROXIMITY SWITCHES

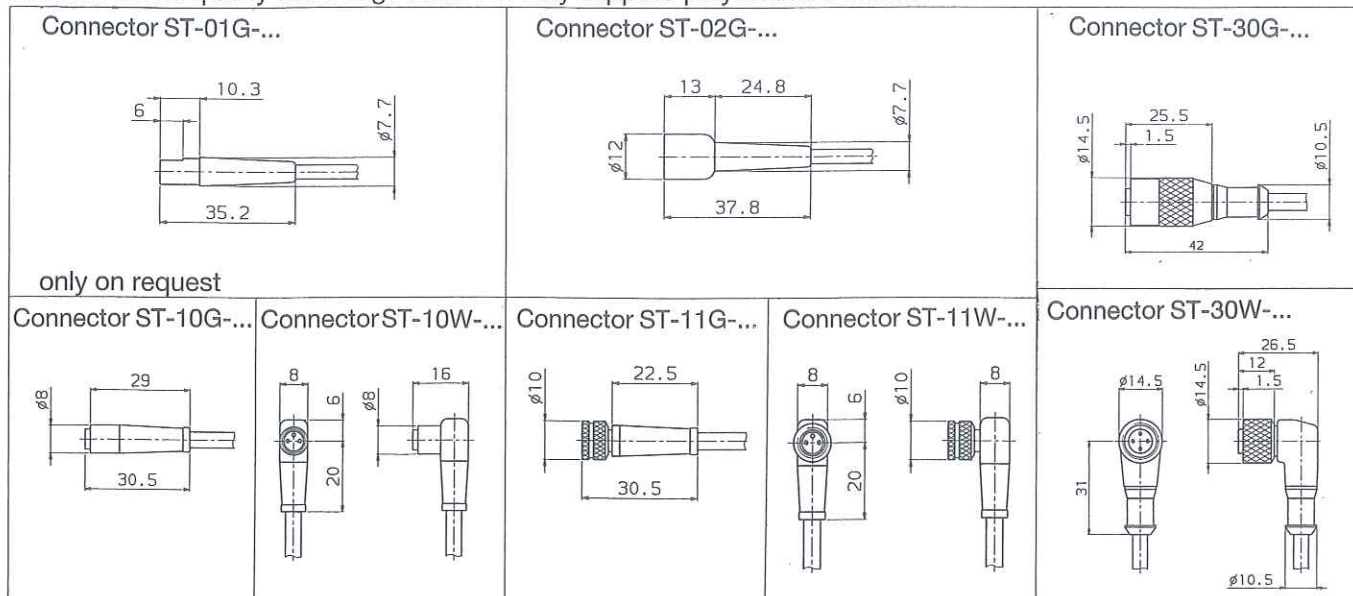
Our standard assortment covers most of our customer's needs. Depending on the application, further criteria may have to be considered. Based on the experience and the necessary flexibility of our company, we can offer a reliable service to our customers for special designs. Because the handling of customized solutions can have a considerable impact, it is understood that, depending on expenditure, a minimum order may be required.

10. 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.

Because of the quality advantage Meto-Fer only supplies polyurethane cables.



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

length \ P/N	straight plug	
	NAMUR-Sensor	LOGIC-Sensor
2m	ST-02G-2A-U2X	ST-02G-4A-U2X
5m	ST-02G-2A-U5X	ST-02G-4A-U5X
9m	ST-02G-2A-U9X	ST-02G-4A-U9X

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

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

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

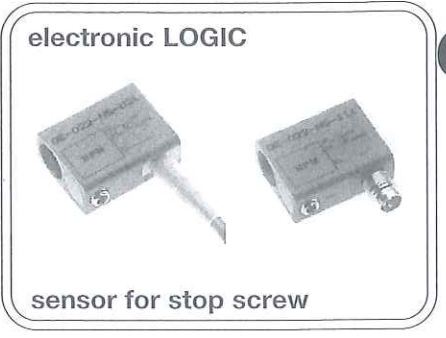
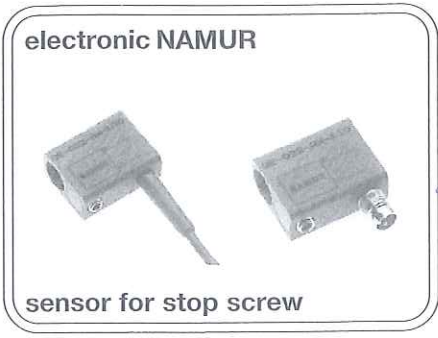
length \ P/N	straight plug (NAMUR / LOGIC)	right angle plug (90°) (NAMUR / LOGIC)
	2m	ST-11G-3B-U2X
5m	ST-11G-3B-U5X	ST-11W-3B-U5X
9m	ST-11G-3B-U9X	ST-11W-3B-U9X

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

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

*Reference codes see back flap.

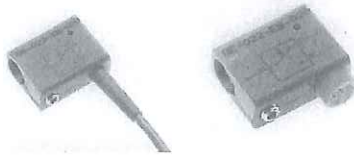
- mechanically adjust stroke limit with electronic or pneumatic sensing device
- element can be plugged on
- Type ..-NS,-PS.: sense with inductive proximity switch
- Type ..-EB: electro-mech. switch
- Type P: 3/2 directional control valve



	22 x 12mm NAMUR	22 x 12mm LOGIC
To plug on the sensing element, all stop screws have the same standardized screw head		
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 13)	integral molded cable or cable with plug (see page 13)	integral molded cable or cable with plug (see page 13)
system of protection per DIN 40050	IP 67 (plug version = IP 65)	IP 67 (plug version = IP 65)
signal transmitter	stop screw	stop screw

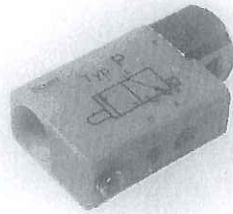
remarks to the part number	Part Number	Part Number
Reference codes see back flap.	QE-022-AX-110 QE-022-AX-020 QE-022-AX-U20	QE-022-NS-11L QE-022-PS-11L QE-022-NS-02L QE-022-PS-02L QE-022-NS-U2L QE-022-PS-U2L

electro-mechanical



switch for stop screw

pneumatic



valve for stop screw

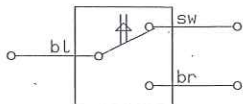
stop screw



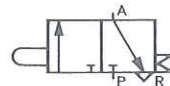
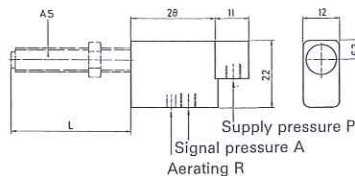
type AS

electro-mechanical

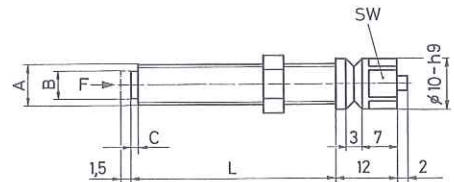
U20/02



type P = pneumatic



stop screws AS



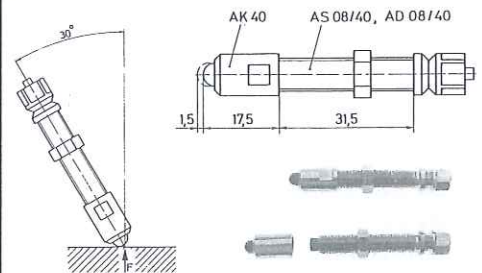
dimensionen

Part No.

A	B	C	L	F max.	Part No.
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

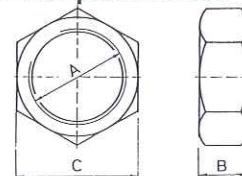
F = force or load (N) $F = m \times a$
 m = mass (kg)
 a = acceleration (m/s²)

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	Part No.
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

QE-022-EB-110
 QE-022-EB-020
 QE-022-EB-U20

Part Number

P
 the pneumatic element is available in one type only