

Safety in system
Protection for man and machine

PRODUCT OVERVIEW

AUTOMATION TECHNOLOGY





INTRODUCTION

How does one introduce a new customer or an interested designer to a portfolio of around 18,000 products and diverse but always complex services?

Our sales engineers are faced with this question whenever they need to talk about our company and its range of services.

This brochure is intended to give you an initial overview of what you can expect from us in the field of automation technology. We present the individual product groups from which we have increasingly developed complete solutions in recent years.

An increasingly important component of our range is qualified services, which we provide through our tec.nicum division and which, in conjunction with our products and solutions, embody our key objective. It is our desire to provide you with up-to-date safety engineering solutions, thereby making the world of work a little safer.

Heinz and Philip Schmersal
Managing Directors of the Schmersal Group

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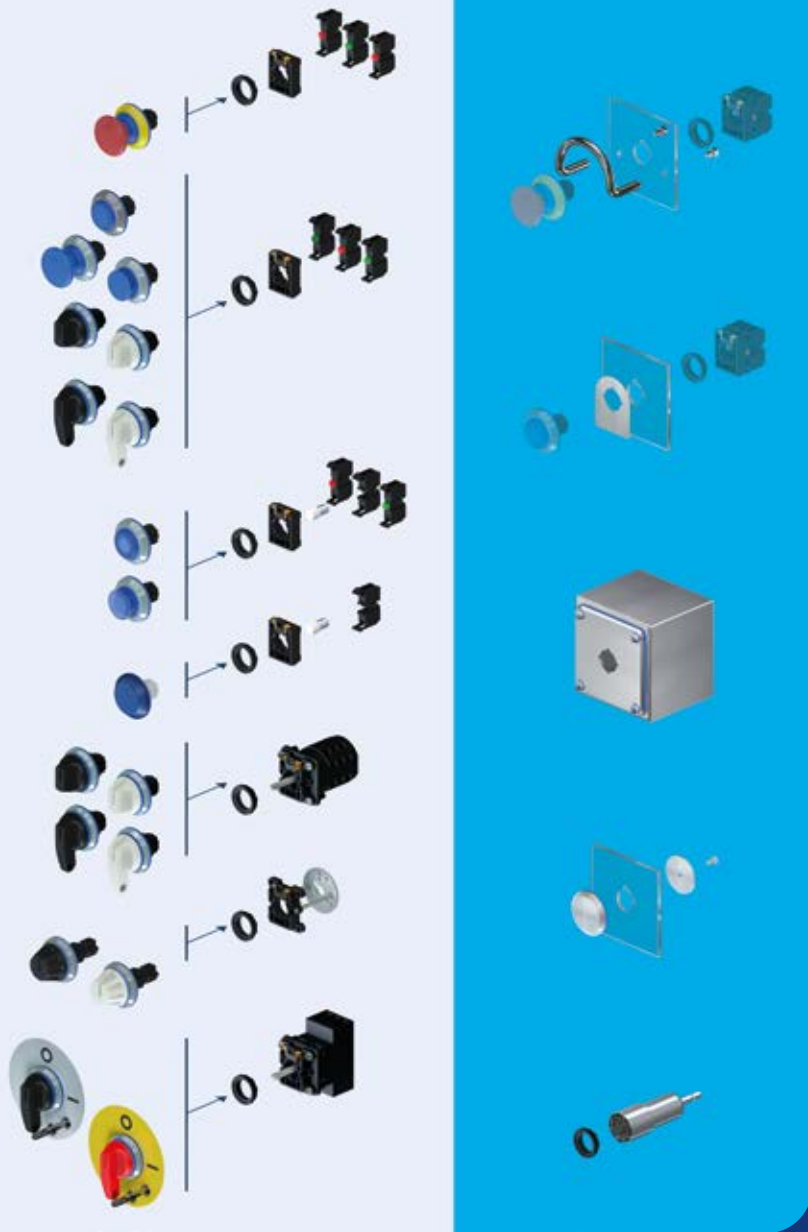
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Web shop

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Here you will find all details and data on our products
which you can order directly online:
products.schmersal.com



H PROGRAMME DESCRIPTION

With the H series, Schmersal presents a complete programme of new command and signalling devices for hygiene-sensitive applications – especially for food processing.

The characteristic features of the command and signalling devices in this programme include gap-free transitions between sealing elements and surfaces and the absence of protruding parts. The devices are easy to clean and are so well sealed that they can withstand regular cleaning, e.g. with high-pressure cleaners or aggressive cleaning agents.

The new series fulfils the requirements of DIN EN ISO 14159 ("Safety of machinery – Hygiene requirements for the design of machinery") and the new version of EN 1672-2 ("Food processing machinery – General principles for design"). This standard specifies very precise requirements for the hygienic design of all operating elements on the human-machine interface (HMI) of food processing machines. Another regulation that formulates requirements for the selection of materials for this area of application was also taken into account.

The new H series not only meets the requirements of the standards and the "Hygienic Design" construction principle, but also has a fully modular structure. Thanks to snap-on contact carriers and individual contacts that can be combined – even in piggyback mode – this concept firstly enables very simple and quick installation, secondly a high degree of flexibility and thirdly it provides the prerequisite for pre-wiring.



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H PROGRAMME

OVERVIEW OF THE SERIES



Range	■ HDRZ40-BL-RT-GB	■ HML	■ HDT	■ HDL	■ HDTP30	■ HDTP40	■ HDLP30	■ HDRZ40
Type	Emergency stop command device	Indicator lights	Push buttons	Illuminated pushbutton	Mushroom head impact button	Mushroom head impact button	Mushroom head impact button, illuminated	Mushroom button with latching function
Material of operating element	Plastic	Plastic	Plastic	Plastic	Plastic	Plastic	Plastic	Plastic
Material of front ring	Plastic	-	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
IP rating	IP67 / IP69K	IP67 / IP69K	IP67 / IP69K	IP67 / IP69K	IP67 / IP69K	IP67 / IP69K	IP67 / IP69K	IP67 / IP69K
Colour of the operating element	■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■
Colour of sealing membranes	■	■	■	■	■	■	■	■
Unlocking type	Pull-to-unlatch mechanism	-	-	-	-	-	-	Pull-to-unlatch mechanism

H PROGRAMME

OVERVIEW OF THE SERIES



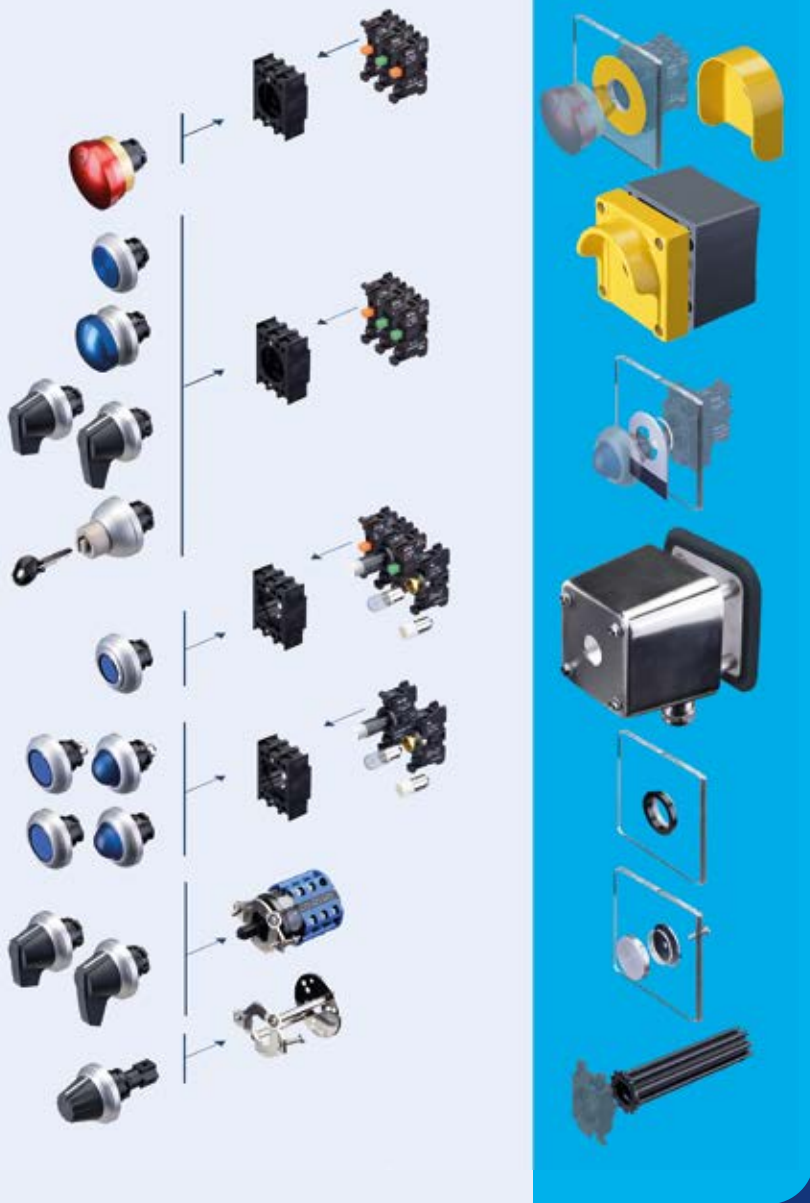
Range	■ HWS / HWT	■ HWS.1 / HWT.1	■ HHS16	■ HHS40	■ HHS63	■ HHS125	■ HWSE	■ HDAN6
Type	Selector switches/ spring-return selector switch with short toggle	Step selector switch with long toggle	Main switch 16A	Main switch 40A	Main switch 63A	Main switch 125A	Step selector switch	Potentiometer drive
Material of operating element	Plastic	Plastic	Plastic	Plastic	Plastic	Plastic	Plastic	Plastic
Material of front ring	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
IP rating	IP67 / IP69K	IP67 / IP69K	IP67 / IP69K	IP67 / IP69K	IP67 / IP69K	IP67 / IP69K	IP67 / IP69K	IP67 / IP69K
Colour of the operating element	■ □	■ □	■ ■	■ ■	■ ■	■ ■	■ □	■ □
Colour of sealing membranes	■	■	■	■	■	■	■	■

H PROGRAMME

CONTACT ELEMENTS, LIGHTING ELEMENTS AND ACCESSORIES



Range	■ CLP001	■ CLP101	■ CLP110	■ SMF	■ SMF-SG	■ HB-BL
Type	Light terminal block	Contact element	Contact element	Mounting flange	Mounting flange for special devices	Blanking plug
Material of the housings	Plastic, self-extinguishing	Plastic, self-extinguishing	Plastic, self-extinguishing	Plastic	Plastic	Stainless steel
Material of the contacts	-	Carrier made from fine silver, phosphor bronze or brass	Carrier made from fine silver, phosphor bronze or brass	-	-	-
IP rating	IP20, IP40	IP20, IP40	IP20, IP40	-	-	-



R PROGRAMME DESCRIPTION

When designing control panels for machines that are used in particularly harsh conditions, we recommend using the R programme. The "R" stands for "robust", which represents a main feature of this switchgear.

Both the mechanical systems and the electrical components are of heavy-duty design. The R series is resistant to mechanical loading and you can also operate it easily when wearing gloves. The use of an adapter ring makes it possible to easily mount series R devices in a 30.5 mm installation diameter without needing additional sealing on the front panel of the machine to seal the installation hole.

The RF contact system developed by Schmersal was also designed for a long service life under high loads. As with the H programme, the user can choose from a variety of different control devices and indicator lights.

If desired, we can supply command devices pre-wired and pre-assembled in the enclosure. An ATEX-compliant version of the R series is also available.



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R PROGRAMME

OVERVIEW OF THE SERIES



Range	■ RDRZ45RT	■ RMLF/RMLH	■ RMEF/RMEH	■ RDT	■ RDL	■ RDP40	■ RDRZ45
Type	Emergency stop command device	Illuminated signal for BA9s	Illuminated signal with integrated LED	Pushbutton	Illuminated pushbutton	Mushroom button without latching function	Mushroom button with latching function
Material of operating element	Aluminium	Glass / plastic	Glass / plastic	Aluminium	Glass	Aluminium	Aluminium
Material of front ring	Aluminium	Aluminium	Aluminium	Aluminium	Aluminium	Aluminium	Aluminium
IP rating	IP65	IP65	IP65	IP65	IP65	IP65	IP65
Colour of the operating element	■	■ ■ ■ ■ ■	■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■
Unlocking type	Pull-to-unlatch mechanism	-	-	-	-	-	Pull-to-unlatch mechanism
Special versions	ATEX	ATEX	ATEX	ATEX	ATEX	ATEX	ATEX

R PROGRAMME

OVERVIEW OF THE SERIES



Range	■ RWS / RWT	■ RWS .1 / RWT .1	■ RSS	■ RST	■ RWSE..K	■ RDAN6
Type	Selector switches/ spring-return selector switches with short toggle	Selector switches/ spring-return selector switches with long toggle	Key selector switch	Key selector switch	Step selector switch	Potentiometer drive
Material of operating element	Plastic	Plastic	Aluminium	Aluminium	Plastic	Plastic
Material of front ring	Aluminium	Aluminium	Aluminium	Aluminium	Aluminium	Aluminium
IP rating	IP65	IP65	IP65	IP65	IP65	IP65
Colour of the operating element	■	■	Metal (silver)	Metal (silver)	■	■
Special versions	ATEX	ATEX	ATEX	ATEX	-	-

R PROGRAMME

CONTACT AND LIGHT TERMINAL BLOCKS



Range	RF	RL	RLDE
Type	Contact element	Light terminal block with Ba9S base	Light terminal block with LED
Material of the housings	PA GV self-extinguishing, hardly flammable	PA GV self-extinguishing, hardly flammable	PA GV self-extinguishing, hardly flammable
Material of the contacts	Fine-silver, phosphor bronze or brass carrier	-	-



ASSEMBLY HOUSINGS DESCRIPTION

The aluminium housings of the **MBGAC** series enjoy universal application owing to their simple and functional design. They offer the user a high level of sturdiness and a sealing concept that has proven its worth over many years. This enclosure series also includes an MBGHAC emergency stop enclosure with integrated protective collar, which is specially designed for the R series emergency stop control devices. This protects the emergency stop from being actuated accidentally and has the advantage for the plant owner of reducing undesirable downtimes.

The **KG** series features ABS plastic housings for simple applications that do not require the highest level of sturdiness. The cable outlets are already mounted on these enclosures, which means that plant manufacturers only need to mount the command devices.

Series **NBG / EX-EBG** assembly housings are made of high-quality stainless steel using a special deep-drawing process; they have been specially developed for hygiene and heavy-duty applications. The special ribbed gasket that surrounds the base of the enclosure on which the enclosure cover is forged, makes it possible to implement the particularly high IP69K degree of protection. The EX-EBG enclosures have an additional integrated reinforcement panel that exceeds the extreme requirements for explosion protection.

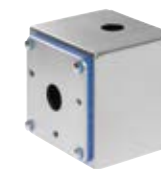
The surface-mounted enclosures in the **NBGLC** series have been developed in accordance with the requirements of EN 1672-2 for hygiene-sensitive areas. The housings consist of a welded base box and a solid housing cover. The sealing elements are specially designed in blue for the hygiene sector.



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ASSEMBLY HOUSINGS

OVERVIEW OF THE SERIES



Range	■ MBGHAC	■ MBGAC	■ KG	■ NBG/EX-EBG	■ NBGLC
Type	Assembly housing for emergency stop with protective collar	Assembly housing	Assembly housing	Assembly housing	Assembly housing
Material of the housings	Aluminium	Aluminium	Plastic	Stainless steel	Stainless steel
Colour of the housing					
Colour of seal	-	-	-		
IP rating	IP65	IP65	IP65	IP67, IP69K	IP67, IP69K
Ambient temperature	-25 °C ... +80 °C	-25 °C ... +80 °C	-25 °C ... +65 °C	-25 °C ... +80 °C	-25 °C ... +80 °C
Number of command positions	1	1 ... 6	1 ... 3	1 ... 5	1 ... 5
Number of cable glands	1	1	1	1 ... 2	1 ... 2



TWO-HAND CONTROL PANELS DESCRIPTION

The job of two-hand controls or two-hand control panels is to ensure that machine operators hands are located on the control panel when they issue the control signal for a hazardous movement. This prevents operators from reaching into the danger area on starting or shortly after starting the machine or process.

The main areas of application for two-hand controls are presses and stamping units in the metal processing or powder metallurgy industries as well as similar machines and systems that involve manual insertion and removal operations. These include printing and paper processing machines, rubber and plastics processing machines, machines involved in the chemical industry and assembly plants.

The two-hand control panels of the Schmersal Group are mounted as standard with an emergency stop pushbutton to EN ISO 13850. In addition, there are guard hoods over the operating elements, which prevent simple manipulation of the protection function using hands, elbows, stomach, hips, thighs or knees, for example. It is also not possible to operate from the back of the control panels.

The devices comply with the requirements of EN ISO 13850, which, amongst other things, specifies the spacing of the controls. Users can choose between different versions that differ, amongst other things, by virtue of the material of the enclosure (plastic and die-cast aluminium). In the central part of the folding enclosure, it is possible to mount up to eight additional command and signalling devices.



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TWO-HAND CONTROL PANELS

OVERVIEW OF THE SERIES



Range	■ SEP02	■ SEPG05	■ SEP09
Housing material	Plastic	Die-cast aluminium	Aluminium
IP rating	IP54	IP54	IP54
Dimensions (L × W × H)	469 × 137 × 185 mm	494 × 160 × 184 mm	155 × 150 × 160 mm (per operating element)
Possible fastening			
On mounting post	■	■	-
Directly on the machine or wall	■	■	■
Command positions			
Number of drilled holes	3	3	1 per operating element
Optional possible command positions	8	8	-
Ø of drilled hole	22.3 mm	22.3 mm	22.3 mm
Features	<ul style="list-style-type: none"> Control panel with 8 additional drilled holes that you can knock out if required 	<ul style="list-style-type: none"> Control panel with 8 additional drilled holes that you can knock out if required 	<ul style="list-style-type: none"> For separate assembly of the controls for two-hand control Specify on user side spacing according to EN ISO 13851



CONTROL PANELS DESCRIPTION

Ergonomic operation of the main machine functions at the human-machine interface is a key factor in safety. The control units should be mounted as close as possible to the safety doors so that operators have an overview of the process.

BDF series control units meet this requirement. This series has been designed for mounting onto the commercially available aluminium profile systems of machine enclosures and you can quickly attach them and integrate them in the ambient structure.



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CONTROL PANELS

OVERVIEW OF THE SERIES



Range	■ BDF20	■ BDF40	■ BDF100	■ BDF200
Type	Control panel with 2 control elements	Control panel with up to 4 control elements	Control panel with 1 control element	Control panel with up to 4 control elements
Housing material	Glass-fibre reinforced thermoplastic, self-extinguishing	Glass-fibre reinforced thermoplastic, self-extinguishing	Glass-fibre reinforced thermoplastic, self-extinguishing	Glass-fibre reinforced thermoplastic, self-extinguishing
IP rating	IP65	IP65	IP65	IP65
Dimensions (W × H × D)				
With protective collar	40 × 133 × 44 mm	40 × 217 × 44 mm	40 × 99 × 69 mm	40 × 220 × 69 mm
Without protective collar	40 × 133 × 25 mm	40 × 217 × 25 mm	40 × 99 × 49 mm	40 × 220 × 49 mm
Features	<ul style="list-style-type: none"> Optional: Emergency stop function with and without protective collar Flexibility thanks to pushbutton cover caps in 12 colours 	<ul style="list-style-type: none"> Optional: Emergency stop function with and without protective collar Slimline design to match the AZM40 solenoid interlock and the DHS-U1 door handle system Flexibility thanks to pushbutton cover caps in 12 colours 	<ul style="list-style-type: none"> Optional: Emergency stop function with and without protective collar Slim, shock-resistant thermoplastic enclosure For mounting on commercially available aluminium profile systems Large product portfolio of operating and lighting elements 	<ul style="list-style-type: none"> Optional: Emergency stop function with and without protective collar Slim, shock-resistant thermoplastic enclosure For mounting on commercially available aluminium profile systems Large product portfolio of operating and lighting elements



DOOR HANDLE SYSTEM DESCRIPTION

The innovative DHS-U1 door handle combines the functions of a robust door handle with the signalling of various machine statuses via large-scale illumination of the handle. The RGB technology used makes it possible to illuminate the handle in seven different colours.

A push button is also available, which can be individually adapted to customer requirements using the coloured push button cover caps supplied. The push button can, for example, fulfil the tasks of a reset function or a request to open the safety guard.



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DOOR HANDLE SYSTEM

OVERVIEW OF THE SERIES



Range	■ DHS-U1
Type	Ergonomic door handle
Compatible with	Standalone, AZM40/BDF40, RSS260, RSS36
Housing material	
Handle	Glass-fibre reinforced thermoplastic
Cover	Translucent PMMA
Dimensions (W × H × D)	40 × 202 × 83 mm
Termination	Connecting cable with connector M12, 5-pole, 0.25 m Connecting cable with connector M12, 8-pole, 0.25 m Connecting cable, 5-core, 5 m Connecting cable, 8-core, 5 m
IP rating	
with operating element	IP66, IP67
without operating element	IP66, IP67, IP69

Accessories

	Description	Colour	Type	Material number
	<ul style="list-style-type: none"> ■ Pushbutton caps ■ Adaptation to individual requirements by simply clipping on 	1 piece per colour: five of each: <ul style="list-style-type: none"> ▪ black ▪ blue ▪ green ▪ red ▪ white ▪ yellow 	BDF40-DHS-PBC-DT BDF40-DHS-PBC-DT-BK BDF40-DHS-PBC-DT-BU BDF40-DHS-PBC-DT-GN BDF40-DHS-PBC-DT-RD BDF40-DHS-PBC-DT-WH BDF40-DHS-PBC-DT-YE	103051694 103052432 103052430 103052429 103052427 103052431 103052428
	<ul style="list-style-type: none"> ■ Illuminated pushbutton caps ■ Adaptation to individual requirements by simply clipping on 	1 piece per colour: five of each: <ul style="list-style-type: none"> ▪ blue ▪ green ▪ red ▪ white ▪ yellow 	BDF40-DHS-PBC-LT BDF40-DHS-PBC-LT-BU BDF40-DHS-PBC-LT-GN BDF40-DHS-PBC-LT-RD BDF40-DHS-PBC-LT-WH BDF40-DHS-PBC-LT-YE	103051229 103052436 103052435 103052433 103052437 103052434
	<ul style="list-style-type: none"> ■ Actuator insert ■ For use of the DHS-U1 without corresponding safety switchgear device 	-	ACC-DHS-U1-INS	103055437
	<ul style="list-style-type: none"> ■ Actuator insert ■ Incl. actuator RST-U-2 and fixing screw ■ For use of the DHS-U1 in conjunction with the safety sensors RSS260 and RSS36 	-	ACC-DHS-U1-INS-U-2	103055438



MAINTAINED JOYSTICK SWITCHES AND SPRING-RETURN JOYSTICK SWITCHES DESCRIPTION

Extremely robust, compact, versatile and functional: These properties make MK/WK series joystick buttons and switches highly suitable for use on machinery and plants in the food-processing and process technology industries. Furthermore, they are suitable for especially harsh industrial applications, including outdoor usage. Compared with multifunctional command systems, such as those used on the control units for cranes and automated guided vehicles (AGV), they need considerably less installation space.

The joystick switches of the RK/NK series are distinguished in particular by fast installation with central nut attachment and connection with M12 connector. The M12 connector is not just fast to install but it also prevents devices from being connected incorrectly.

The RK series is ideally suited for use in outside areas thanks to the special sealing boot and the new sealing concept. The silicon sealing boot is very capable even with high UV radiation.

The joystick switches of the NK series follow the principles of "hygienic design" thanks to their tried-and-tested construction without corners and edges and are particularly suitable for hygienic applications. The use of food-safe and largely chemically resistant materials ensures that daily cleaning with aggressive cleaning agents has little effect on the appliances.

The new sealing concept with up to three barriers prevents the ingress of fluid even if the sealing boot should become damaged. This provides enough time to renew the defective boot assembly without causing any damage to the machine during cleaning from the ingress of fluid.



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MAINTAINED JOYSTICK SWITCHES AND SPRING-RETURN JOYSTICK SWITCHES

OVERVIEW OF THE SERIES



Range	■ MKT	■ MKS	■ WKT	■ WKS	■ NK	■ RK
Type	Spring-return joystick switch	Maintained joystick switch	Spring-return joystick switch	Maintained joystick switch	Maintained/spring-return joystick switch	Maintained/spring-return joystick switch
Mounting hole	22.3 mm	22.3 mm	30.5 mm	30.5 mm	22.3 mm	22.3 mm
IP rating	IP65, IP67	IP65, IP67	IP65, IP67	IP65, IP67	IP65, IP67, IP69 (front) IP67 (contact chamber)	IP65, IP67, IP69 (front) IP67 (contact chamber)
Mounting ramp edge	Knurled nut	Knurled nut	Mounting flange	Mounting flange	central nut SW41	central nut SW41
Material of the front ring	Al anodised	Al anodised	Al anodised	Al anodised	Plastic	Plastic
Length of actuator	77 mm	77 mm	90 mm	90 mm	85 mm	85 mm
Bellows	<ul style="list-style-type: none"> • Rubber • WKT-19.4: Rubber • WKT-19.3: Silicone • WKT-26: Silicone (IP69K) 	<ul style="list-style-type: none"> • Rubber • WKT-19.4: Rubber • WKT-19.3: Silicone • WKT-26: Silicone (IP69K) 	<ul style="list-style-type: none"> • Rubber • WKT-19.4: Rubber • WKT-19.3: Silicone • WKT-26: Silicone (IP69K) 	<ul style="list-style-type: none"> • Rubber • WKT-19.4: Rubber • WKT-19.3: Silicone • WKT-26: Silicone (IP69K) 	<ul style="list-style-type: none"> • Silicone (IP69K) 	<ul style="list-style-type: none"> • Silicone (IP69K)

FOOT SWITCHES DESCRIPTION

Safety foot switches are mounted on machines and plants in cases where manual operation is not possible. They are used to initiate and shutdown work and production cycles.

Depending on the ambient conditions and mechanical load, there are different foot switch variants. The robust foot switches in a metal design are used generally in machine tools and plants, e.g. on presses, punches, bending and sheet metal machinery etc.

The plastic foot switches of the NKF series are used as signal generators for switching on and off process and production sequences. They are used in all industrial environments such as in the textile industry, logistics and material handling and also in the packaging industry.

All foot switches in the range TF 232 are available both with protective cover (ordering suffix H) and without. The devices equipped with either slow action or snap action switch inserts are available as both single-pedal and double-pedal variants. Up to 4 contacts are available per pedal.

The additional contact staggering and bi-stable operating principles expand the wide range of possible uses.

The plastic foot switches in the range NKF offer solutions for up to three pedals with either NO contacts or change-over contacts. The pre-assembled variants are equipped as standard with a 2 meter pre-wired cable.



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FOOT SWITCHES

OVERVIEW OF THE SERIES



Range	■ F 232	■ 2F 232	■ NKF	■ NKF2	■ NKF3
Type	with 1 foot pedal	with 2 foot pedals	with 1 foot pedal	with 2 foot pedals	with 3 foot pedals
Material of the housings	Die-cast aluminium	Die-cast aluminium	Plastic	Plastic	Plastic
Material of the pedal	Plastic	Plastic	Plastic	Plastic	Plastic
IP rating	IP65	IP65	IP67	IP67	IP67
Dimensions (W × H × D)	170 × 189 × 274 mm	295 × 189 × 274 mm	77 × 49 × 123 mm	215 × 49 × 138 mm	351 × 49 × 150 mm
Connections	Screw connection	Screw connection	Pre-wired cable	Pre-wired cable	Pre-wired cable
Contact options	11: 1 NO + 1 NC 02: 2 NC 20: 2 NC 22: 2 NO + 2 NC 04: 4 NC 40: 4 NO	11: 1 NO + 1 NC 02: 2 NC 20: 2 NC 22: 2 NO + 2 NC 04: 4 NC 40: 4 NO	1PW (1 change-over contacts) 2PW (2 change-over contacts) 10 = 1 NO 20 = 2 NO	1PW (1 change-over contacts) 2PW (2 change-over contacts) 10: 1 NO 20: 2 NO (all pedals identical)	1PW (1 change-over contacts) 2PW (2 change-over contacts) 10: 1 NO 20: 2 NO (all pedals identical)
Options	<ul style="list-style-type: none"> Protective shield (H) Contact staggering (HD) Bi-stable electrical contact (F) 	<ul style="list-style-type: none"> Protective shield (H) Contact staggering (HD) Bi-stable electrical contact (F) 	<ul style="list-style-type: none"> Left, right or rear cable 	<ul style="list-style-type: none"> Left, right or rear cable 	<ul style="list-style-type: none"> Left, right or rear cable



POSITION SWITCHES DESCRIPTION

Typically used to determine the position or presence of moving parts, work pieces, or conveyed materials, or to monitor the position of rotating or sliding machine guards, these limit switches can be utilised in automation, elevator, and safety applications. They are dust-tight and resistant to powerful water jets (IP66) and immersion in water (IP67), making them suitable for use in harsh industrial environments.

The actuator elements can be adjusted on site: rotated to one of eight positions – in 45° increments relative to the housing – or replaced by other elements. With many actuator elements to choose from, they are easily adaptable to many applications.



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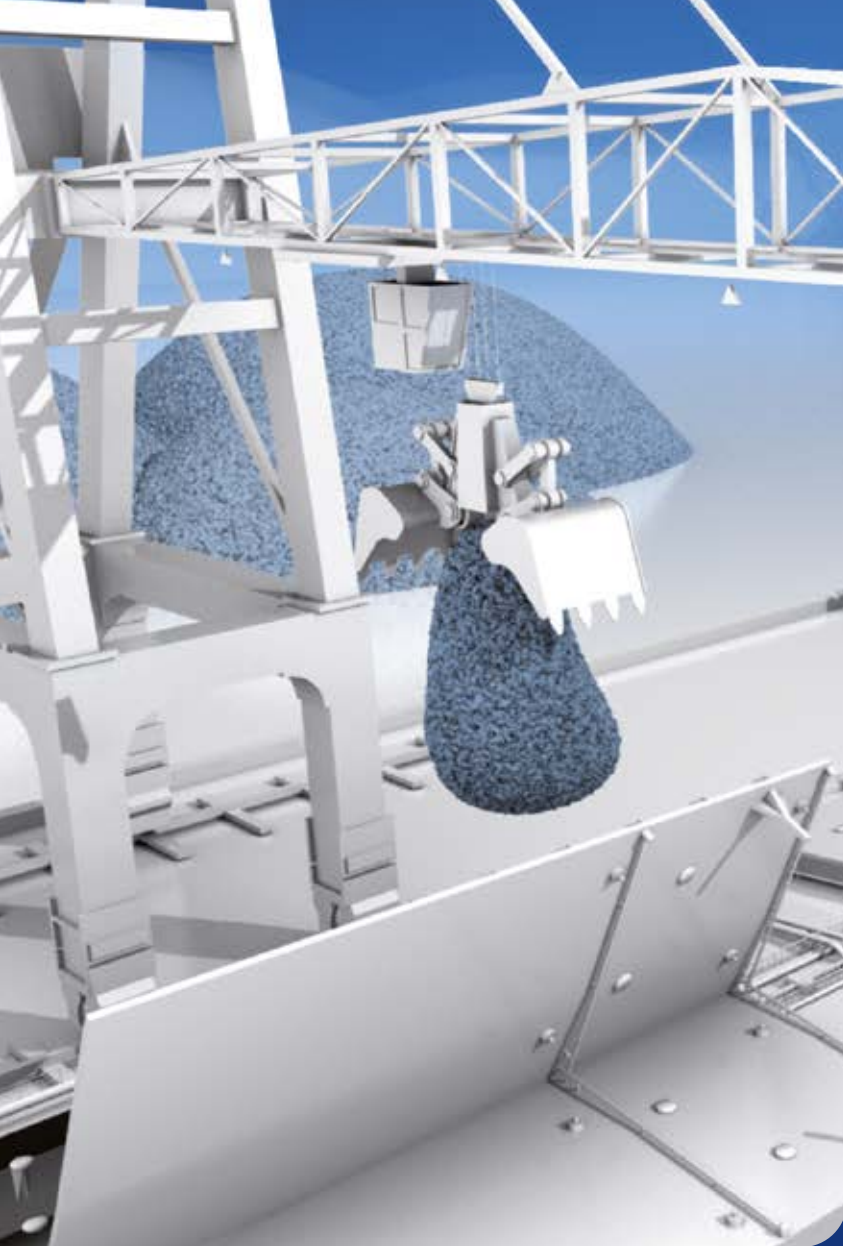
POSITION SWITCHES

OVERVIEW OF THE SERIES



Range	■ PS116	■ PS215	■ PS216	■ PS226	■ PS315	■ PS316
Enclosures	Thermoplastic Metal (head)	Metal	Thermoplastic	Thermoplastic	Metal	Thermoplastic
IP rating	IP66, IP67	IP66, IP67	IP66, IP67	IP66, IP67	IP66, IP67	IP66, IP67
Dimensions (W × H × D)	31 × 52 × 16.6 mm	31 × 66 × 33 mm	31 × 66 × 33 mm	59 × 56 × 33 mm	40 × 77.7 × 37.2 mm	40 × 77.7 × 37.2 mm
Termination	Connector plug Prewired cable	Screw connection Connector plug	Screw connection Connector plug	Screw connection Connector plug	Screw connection Connector plug	Screw connection Connector plug
Contact options	1 NO + 1 NC 2 NO + 1 NC 1 NO + 2 NC 2 NC 3 NC	1 NO + 1 NC 2 NO + 1 NC 1 NO + 2 NC 2 NO 2 NC 3 NC	1 NO + 1 NC 2 NO + 1 NC 1 NO + 2 NC 2 NO 2 NC 3 NC	1 NO + 1 NC 2 NO + 1 NC 1 NO + 2 NC 2 NO 2 NC 3 NC	1 NO + 1 NC 2 NO + 1 NC 1 NO + 2 NC 2 NO 2 NC 3 NC	1 NO + 1 NC 2 NO + 1 NC 1 NO + 2 NC 2 NO 2 NC 3 NC
Ambient temperature	-30 °C ... +80 °C	-30 °C ... +80 °C	-30 °C ... +80 °C	-30 °C ... +80 °C	-30 °C ... +80 °C	-30 °C ... +80 °C
Features	<ul style="list-style-type: none"> Large range of actuating elements Rotatable heads 45° steps 	<ul style="list-style-type: none"> Large range of actuating elements Rotatable heads 45° steps Optional with LED 	<ul style="list-style-type: none"> Large range of actuating elements Rotatable heads 45° steps Optional with LED 	<ul style="list-style-type: none"> Large range of actuating elements Rotatable heads 45° steps Optional with LED 	<ul style="list-style-type: none"> Large range of actuating elements Rotatable heads 45° steps Optional with LED 	<ul style="list-style-type: none"> Large range of actuating elements Rotatable heads 45° steps Optional with LED
Actuator selection *						
Special versions	-	ATEX	-	-	ATEX	-

* Most rollers are also available in stainless steel or brass. Please contact our technical sales department or visit products.schmersal.com.



POSITION AND LIMIT SWITCHES DESCRIPTION

Position and limit switches are used for position detection and monitoring of moving parts in machinery and plants. The various series are suitable for applications including steel processing, the transport and handling of bulk materials, as well as in other fixed plants and vehicles.

Various series are available, all of which are equipped with a robust metal enclosure and all of which are suitable for position detection under extreme ambient conditions. These include types with extended temperature ranges, covering applications at high temperature in steel works or foundries, as well as applications at low temperature in cold store warehouses. The enclosures, coated in a dual-component finish, protect the switches from oil, grease, salt and acids in diluted concentrations.

The ATEC/IECEX-certified types allow for use in potentially explosive environments. Corresponding solutions exist for zones 1 and 21.

In the individual series there are, in addition to the various standard actuators, also individual actuating elements for different applications. With the switching elements, the user has the choice of a number of different variants with up to six contacts.

Position and limit switches have been part of the core programme of the Schmersal Group for decades. The variety of designs and product ranges is correspondingly large.



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POSITION AND LIMIT SWITCHES

OVERVIEW OF THE SERIES



Range	■ M 330	■ T/M 015	■ T 016	■ T/M 017	■ T 422	■ T/M 441	■ T 454	■ T/M 461
Range	Selection table	S0	S0	S0	S1	S1	S1	S1
Enclosures	Die-cast aluminium	Die-cast aluminium	Die-cast aluminium	Die-cast aluminium	Grey cast iron, galvanised	Grey cast iron, galvanised	Grey cast iron, galvanised	Grey cast iron, galvanised
IP rating	IP65	IP65	IP65	IP65	IP65	IP65	IP66, IP67	IP65
Dimensions (W × H × D)	40 × 76 × 40 mm	67 × 75 × 43 mm	67 × 105 × 43 mm	67 × 130 × 43 mm	75 × 71 × 63 mm	75 × 99 × 63 mm	83 × 127 × 64 mm	83 × 155 × 64 mm
Termination	Screw terminals	Screw connection	Screw connection	Screw connection	Screw connection	Screw connection	Screw connection	Screw connection
Switching principle	Snap action	Slow action or snap action, positive break NC contacts	Slow action, positive break NC contact	Slow action or snap action, positive break NC contacts	Slow action, positive break NC contact	Slow action or snap action, positive break NC contact	Slow action, positive break NC contact	Slow action or snap action, positive break NC contacts
Number of contacts	2	2	3	4	1	2	2 or 4	3 or 4
Ambient temperature	-30 °C ... +90 °C up to -40 °C (-1172) up to +160 °C (-1366)	-30 °C ... +90 °C	-30 °C ... +90 °C	-30 °C ... +90 °C	-30 °C ... +90 °C -40 °C ... +200 °C	-30 °C ... +90 °C -40 °C ... +200 °C	-40 °C ... +70 °C	-30 °C ... +90 °C -40 °C ... +200 °C
Actuator selection	S, 2S, 3S, R, 3R, K, 3K, AF, 4D, V., H, 2H, 3H, 4H, 6H, 7H, 8H, 9H, 10H	S, 2S, K, 2K, 3K, H, 2H, 3H, 4H, 6H, 7H, 8H, 9H, 10H	S, 2S, K, 2K, 3K, H, 2H, 3H, 4H, 6H, 7H, 8H, 9H, 10H	S, 2S, K, 2K, 3K, H, 2H, 3H, 4H, 6H, 7H, 8H, 9H, 10H	S, 2S, R, K, J, 2C, L, D	S, 2S, R, K, J, 2C, L, D	S, 2S, R, K, J, 2C, L, D	S, 2S, R, K, J, 2C, L, D
Special versions	ATEX	-	-	-	-	ATEX	-	-

POSITION AND LIMIT SWITCHES

OVERVIEW OF THE SERIES



Range	■ U 432	■ U 433	■ U 434	■ T/M 035	■ T/M 250	■ T/M 064	■ T/M 471	■ BS655 / BS656
Range	U	U	U	S3	S3	S2	S2	HDS
Enclosures	Die-cast aluminium	Die-cast aluminium	Die-cast aluminium	Grey cast iron, galvanised	Grey cast iron, galvanised	Grey cast iron, galvanised	Grey cast iron, galvanised	Grey cast iron or thermosetting resin
IP rating	IP65	IP65	IP65	IP67	IP67	IP65	IP65	IP66, IP67
Dimensions (W × H × D)	62 × 80 × 50 mm	62 × 116 × 50 mm	62 × 127 × 50 mm	58 × 142 × 61.5 mm	103 × 180 × 125 mm	149 × 156 × 111 mm	130 × 194 × 150 mm	234 × 108 × 143 mm
Termination	Screw terminals	Screw connection	Screw connection	Screw connection	Screw connection	Screw connection	Screw connection	Screw connection
Switching principle	Slow action	Slow action	Slow action	Slow action or snap action, positive break NC contacts	Slow action or snap action, positive break NC contacts	Slow action or snap action, positive break NC contacts	Slow action or snap action, positive break NC contacts	Snap action or slow action
Number of contacts	2	3	4	2	2 or 4	3 or 4	4 or 6	4
Ambient temperature	-20 °C ... +60 °C	-20 °C ... +60 °C	-20 °C ... +60 °C	-30 °C ... +90 °C	-30 °C ... +90 °C	-30 °C ... +90 °C	-30 °C ... +90 °C	-40 °C ... +70 °C
Tropical and temperature resistant	up to -30 °C (-1272)	up to -30 °C (-1272)	up to -30 °C (-1272)	-	-40 °C ... +200 °C	-	-	-
Actuator selection	S, K, V., H, 2H, 3H, 4H, 6H, 7H, 8H, 9H, 10H	S, K, V., H, 2H, 3H, 4H, 6H, 7H, 8H, 9H, 10H	S, K, V., H, 2H, 3H, 4H, 6H, 7H, 8H, 9H, 10H	2L, D	2L, D	S, J, X, L, A, 2A, V, Z, 2Z, 4D	S, J, X, L, A, 2A, V, Z, 2Z, 4D	BS-H50-110-RKS, BS-H50-110-RVA
Special versions	-	-	-	-	ATEX	ATEX	-	ATEX, Dupline®

POSITION AND LIMIT SWITCHES

ACTUATOR HEADS

Series S0

S	Plunger
2S	Telescopic plunger
K	Offset roller lever
2K	Tilt lever
3K	Angle roller lever
V.	Rod lever
H	Roller lever H
2H	Leaf spring lever 2H
3H	Roller lever 3H
4H	Spring rod lever on shaft 4H
6H	Leaf spring lever 6H
7H	Roller lever 7H
8H	Roller lever 8H
9H	Rod lever 9H
10H	Rod lever 10H

Series M 330

S	Plunger
2S	Telescopic plunger
3S	Side plunger
R	Roller plunger
3R	Side roller plunger
K	Offset roller lever
3K	Angle roller lever
AF	Spring rod lever
4D	Fork roller lever
V.	Rod lever
H	Roller lever H
2H	Leaf spring lever 2H
3H	Roller lever 3H
4H	Spring rod lever on shaft 4H
6H	Leaf spring lever 6H
7H	Roller lever 7H
8H	Roller lever 8H
9H	Rod lever 9H
10H	Rod lever 10H

Series S1

S	Plunger
2S	Telescopic plunger
R	Roller plunger
K	Offset roller lever
J	Offset roller lever
2C	Fork lever
L	Roller lever L
D	Roller lever D

Series U

S	Plunger
K	Offset roller lever
V.	Rod lever
H	Roller lever H
2H	Leaf spring lever 2H
3H	Roller lever 3H
4H	Spring rod lever on shaft 4H
6H	Leaf spring lever 6H
7H	Roller lever 7H
8H	Roller lever 8H
9H	Rod lever 9H
10H	Rod lever 10H

Series S2

S	Plunger
J	Offset roller lever
X	Offset roller lever
L	Roller lever L
A	Roller lever A
2A	Roller lever 2A
V	Roller lever V
Z	Pull lever Z
2Z	Pull lever 2Z
2C	Fork lever 2C
4D	Offset roller lever 4D

Series S3

2L	Roller lever
D	Roller lever

Detailed information about the products and actuators can be found at products.schmersal.com.





POSITION SWITCHES – SPECIAL VARIANTS

DESCRIPTION

Gear switches

Gear limit switches are used in the materials lifting and handling industry, roller doors, stage systems etc. Depending on the contact configuration, they are used for deactivation or for positioning motion sequences. The drive is provided via a shaft.

Both the enclosure, which is largely made of a seawater-resistant die-cast alloy housing, and the covers made of shock-resistant thermoplastic resistant to many chemicals are suitable for extreme ambient conditions.

Rotating spindle limit switches

Rotating spindle limit switches are used in, among other areas, machine tools, cranes and material handling plants. The robust cast-iron enclosure with 2-component paint finish is suitable for extreme ambient conditions. The movement range of the spindle of between 4 and 55 turns permits exact switching of the change-over contact with galvanically separated contact bridges.

Slack-wire switches

Slack-wire switches are used to monitor the wire tension. A slack, sagging wire, for example here on a material handling plant, releases the normally actuated switch and the plant is switched off.

Belt alignment switches

Belt alignment switches monitor the straight running of conveyor plants. If the conveyor belt moves off-centre from the drive and pulleys the switching devices trigger.

With staggered switching a pre-warning for example is initiated with 10° deviation and the conveyor belt is switched off for example at 25°. Individual staggered switching is available upon request. In addition to multiple versions of belt alignment switches, Schmersal offers a comprehensive programme of stainless steel rollers with different lengths and diameters.



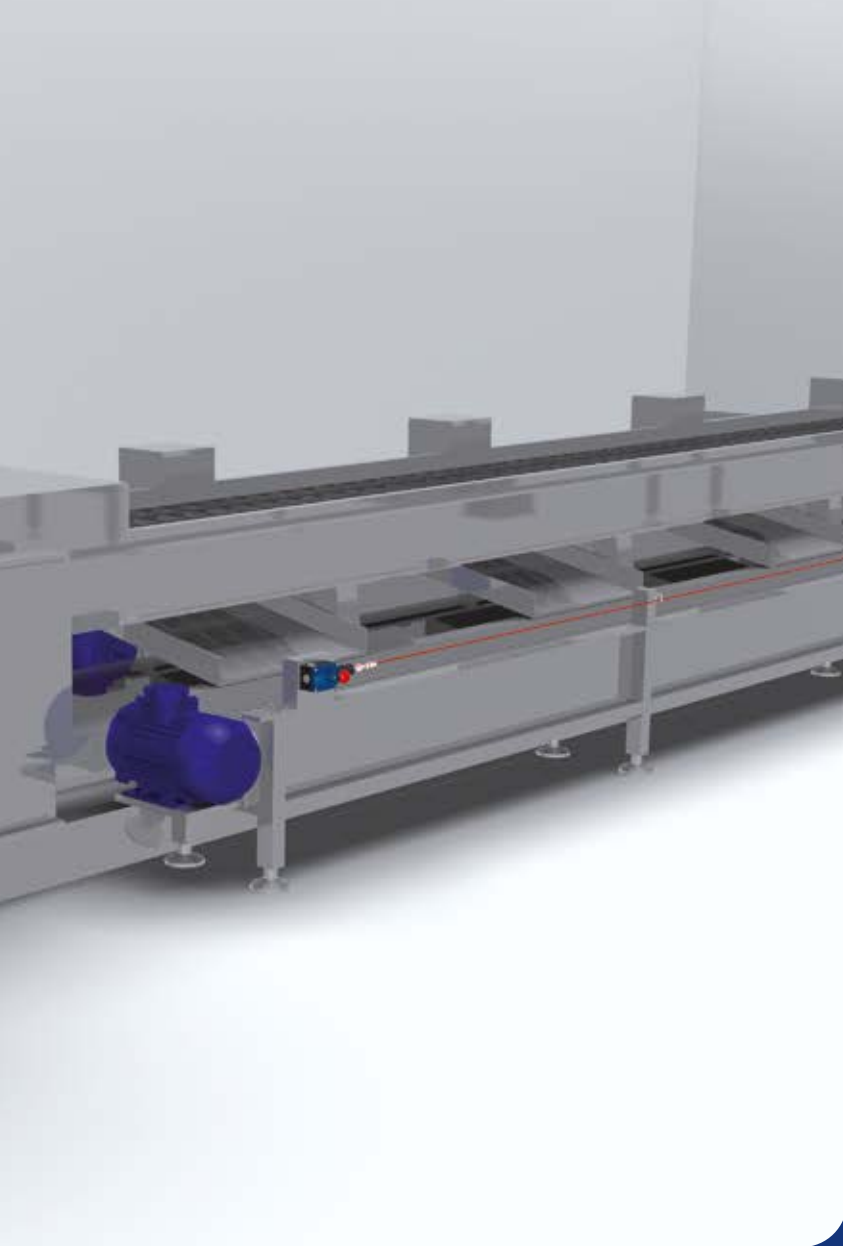
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POSITION SWITCHES – SPECIAL VARIANTS

OVERVIEW OF THE SERIES



Range	■ G50 / G150	■ MSP 452	■ T/M 441	■ M 330	■ T/M 441	■ T/M 250	■ BS655 / BS656
Range	Gear switch	Rotating spindle limit switch	Slack-wire switch	Belt alignment switch	Belt alignment switch	Belt alignment switch	Belt alignment switch
Enclosures	Metal with shock-resistant thermoplastic cover	Grey cast iron, 2K paint	Grey cast iron, 2K paint	Aluminium die-cast, paint finish	Grey cast iron, 2K paint	Grey cast iron, 2K paint	Grey cast iron or thermosetting resin
IP rating	IP65	IP65	IP65	IP65	IP65	IP67	IP66, IP67
Dimensions (W × H × D)	200 × 114 × 120 mm	118 × 174 × 64 mm	106 × 181 × 63 mm	40 × 76 × 40 mm	106 × 105 × 63 mm	62 × 58 × 50 mm	234 × 108 × 143 mm
Termination	Screw terminals	Screw connection	Screw connection	Screw connection	Screw connection	Screw connection	Screw connection
Switching principle	Slow action or snap action, positive break NC contact	Snap action	Slow action or snap action, positive break NC contact	Snap action with self-cleaning contact	Snap action or slow action	Snap action or slow action	Snap action or slow action
Number of contacts	up to 8	4	2	2	2	4	4
Ambient temperature	-30 °C ... +80 °C	-30 °C ... +90 °C	-30 °C ... +90 °C	-30 °C ... +90 °C	-30 °C ... +90 °C	-30 °C ... +90 °C	-40 °C ... +70 °C
Features	<ul style="list-style-type: none"> Different cam forms for various switching travels Switching point adjustment using disc cams with front setting (e.g. 1600-1) 	<ul style="list-style-type: none"> Movement range 4 ... 55 turns 	<ul style="list-style-type: none"> Suitable for heavy duty 	<ul style="list-style-type: none"> Adjustable length lever with nylon roller Belt speeds ≤ 1 m/s 	<ul style="list-style-type: none"> Stainless steel roller Belt speeds ≤ 3 m/s (roller Ø 30 mm) 	<ul style="list-style-type: none"> Stainless steel roller Belt speeds ≤ 6 m/s (roller Ø 50 mm) 2 switching angles (prewarning, deactivation) 	<ul style="list-style-type: none"> Platform concept with different function units Different actuating elements
Special versions	-	-	ATEX	-	ATEX	ATEX	ATEX, Dupline®



PULL-WIRE SWITCHES DESCRIPTION

Pull-wire switches are used on machinery and plants for signalling and/or for area monitoring. The switching command can be activated at arbitrary points on the wire run.

The areas of application range from giving commands in the production process to starting and stopping machines and opening or closing electrically driven doors and gates.

The way of functioning is dependent on the application and the type of pull-wire switch that has been selected. Types with wire pull and wire breakage detection require the wire to be pre-tensioned so that the pull-wire switch is in the switching condition. The switching function is activated if the tensioned pull wire is pulled or in the event of wire breakage. In this case, the normally-closed contacts are opened and the normally-open contacts are closed.

On types with wire pull function, the switching function is activated by a quick pull on the wire. In this case, the pull-wire switch must be fitted vertically. Types with varying pulling forces are available, depending on the application.



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PULL-WIRE SWITCHES

OVERVIEW OF THE SERIES



Range	■ TQ215 / TQ315	■ TQ700 / TQ700S	■ TQ900	■ TQ441	■ TQ201	■ RS655 / RS656
Enclosures	Metal	Thermoplastic	Metal Thermoplastic (cover)	Metal	Metal	Grey cast iron Thermoplastic
IP rating	IP66, IP67	IP67	IP65, IP67	IP65	IP54	IP66, IP67
Dimensions (W × H × D)	215: 31 × 93.5 × 32.5 mm 315: 40 × 93.5 × 32.5 mm	40.5 × 160 × 51 mm	71 × 220 × 69.7 mm	106 × 135 × 61 mm	60 × 250 × 32 mm	234 × 108 × 119 mm
Connections	Screw connection	Screw connection	Screw connection	Screw connection	Pre-wired cable	Screw connection
Actuating force	65 N	TQ700: 17 N TQ700S: 88 N (40 N)	42 N	17 N (4 N)	44 N	18 N
Contact options	2 NC 1 NO + 1 NC 1 NO + 2 NC	2 NO 1 NO + 1 NC 2 NC	1 NO + 1 NC 2 NC 1 NO + 3 NC 2 NO + 2 NC 4 NC	2 NC	1 NC 1 NO + 1 NC	2 NO + 2 NC
Max. wire length	25 m	10 m	75 m	25 m	-	100 meters (both directions)
Features	▪ Alignment straight, to the left or right	▪ TQ700S: vertical mounting	-	-	▪ Vertical mounting	▪ Bi-directional ▪ Reset pushbutton
Special versions	-	-	-	-	-	ATEX, DuplineSafe®

Accessories

Wire rope	Eyebolt	Tension spring	Wire clamp	Turnbuckle	Wire thimbles	Rope tensioner S900	Shackle

MAGNETIC REED SWITCHES DESCRIPTION

Magnetic reed switches operate without contact and are preferably used where mechanically actuated limit switches no longer work satisfactorily due to unfavourable operating conditions. Magnetic reed switches are particularly suitable for low-wear and low-maintenance applications in automation technology. The magnetic switch is activated when the actuating magnet approaches the detection area; the circuit is closed or opened – without any mechanical contact.

This non-contact switching principle ensures a long service life and low maintenance. Magnetic reed switches are extremely safe to contact and offer numerous advantages for use in automation. Due to their fast response time, they are ideal for highly dynamic processes where precise and immediate switching is required. Thanks to their compact design, they can be easily integrated even in confined spaces. They are also highly reliable, even in dusty or damp environments.

Magnetic switches are therefore an efficient, cost-effective and low-maintenance solution for numerous tasks in automation and control technology. They are ideal for position detection, monitoring and executing simple switching functions and make a significant contribution to operational safety and process optimisation.



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MAGNETIC REED SWITCHES

OVERVIEW OF THE SERIES



Range	■ BN80	■ BN85	■ BN310	■ BN325	■ BN20	■ BN75	■ BN120	■ BN650
Design	Rectangular, flat	Rectangular	Rectangular, flat	Rectangular	Rectangular	-	Cylindrical, Ø 12 mm	Cylindrical, Ø 13 mm
Actuation direction	Lateral	Front side	Side or front available on request	Lateral	Side or front	Float switch	Side or front	Side or front
Contact options	Bistable contact NC / NO	Bistable contact	Bistable contact NC / NO	Bistable contact	Bistable contact NC / NO	NC / NO	Bistable contact NC / NO	Bistable contact NC / NO
Max. switching distance	60 mm	40 mm	60 mm	55 mm	50 mm	-	60 mm	60 mm
Material of the housings	Plastic	Plastic	Plastic	Plastic	Metal	Plastic	Plastic	Plastic
Dimensions (B × T × H)	44 × 13 × 9 mm	40 × 35 × 16.5 mm	88 × 25 × 13 mm	85 × 26 × 24 mm	104 × 52 × 47 mm	80 × 99.5 × 55 mm	Ø12 × 71 mm	Ø13 × 103 mm
IP rating	IP67	IP40	IP67	IP40 / IP67	IP67	IP68, IP65 (connector) IP67 (cable)	IP67	IP67
Ambient temperature	-25 °C ... +75 °C	0 °C ... +75 °C	-25 °C ... +75 °C	-25 °C ... +75 °C	-25 °C ... +90 °C	-25 °C ... +80 °C	-25 °C ... +70 °C	-25 °C ... +70 °C
Termination	LiYY cable, 1 m	2 single conductors LiY, 1 m	Cable H03VV-F	Various connection types	Screw connection	M12 connector or pre-wired cable	LiYY cable, 1 m	LiYY cable, 1 m

You can find the right actuating magnets directly under the respective items at products.schmersal.com.

MAGNET TRACK SENSOR BOX DESCRIPTION

Magnetic switching systems are characterised by wide-ranging wear resistance and tolerance in the event of misalignment. Magnetic switches are used for positioning and control in electric monorail systems and in lift construction.

The SSB-R sensor box captures the field of suitable actuator magnets on four independent tracks and, on pass-by, changes the signal status. This level change, which is also generated during a fast pass-by, remains safe at zero-voltage until the next control.

A connected control unit uses the signals to determine the position and section of the sensorbox and controls, for example, the speed or holding positions of the drive motor. In addition, two angle sensors enable fine positioning.



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MAGNET TRACK SENSOR BOX

OVERVIEW OF THE SERIES



Range	■ SSB-R-NG-1	■ SSB-R-NG-2	■ SSB-RH-NG-1	■ SSB-RH-NG-2
Design	Rectangular, flat	Rectangular, flat	Rectangular, flat	Rectangular, flat
Actuation direction	Front side	Front side	Front side	Front side
Switching principle	Reed technology	Reed technology	Reed and hall technology	Reed and hall technology
Switching area	2 ... 15 mm	2 ... 15 mm	2 ... 15 mm	2 ... 15 mm
Material of the housings	Glass-fibre reinforced thermoplastic	Glass-fibre reinforced thermoplastic	Glass-fibre reinforced thermoplastic	Glass-fibre reinforced thermoplastic
Dimensions (B × T × H)	110 × 24.4 × 125 mm	110 × 24.4 × 125 mm	110 × 24.4 × 125 mm	110 × 24.4 × 125 mm
Degree of protection	IP67	IP67	IP67	IP67
Ambient temperature	-25 °C ... +70 °C	-25 °C ... +70 °C	-25 °C ... +70 °C	-25 °C ... +70 °C
Termination	Connector plug M12, 8-pole	Connector plug/socket M12, 8-pole, A-coded	Connector plug M12, 8-pole	Connector plug/socket M12, 8-pole, A-coded



TIME OF FLIGHT CAMERA DESCRIPTION

The AM-T100 is the ideal camera for automating your processes. It enables you to perform tasks in the areas of quality assurance, data acquisition and process control in production and logistics at high speed.

As the camera works with 3D image data and is independent of ambient light, it can detect and evaluate objects even in fluctuating lighting conditions, low contrasts and changing colours, unlike 2D cameras.

Its strengths include presence detection, volume calculation and structure evaluation. Software that can be used to configure virtual surveillance zones in 3D space is also integrated. If these zones are violated by objects, digital outputs switch. The zones can also be controlled by digital inputs to optimise their use in processes.

With its compact design, the AM-T100 is easy to integrate in line production, on processing machines or in intralogistics and is an important step on the way to your smart factory.

Our team of specialists will be happy to support you in creating customised software and integrating it into your system environment.

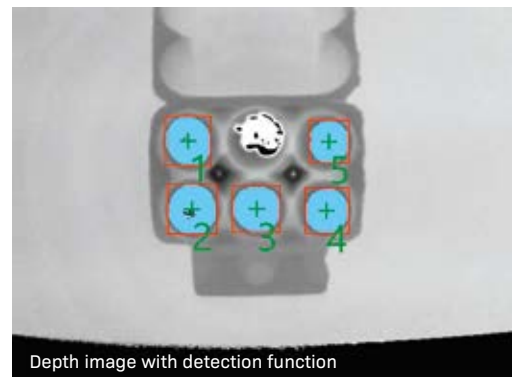
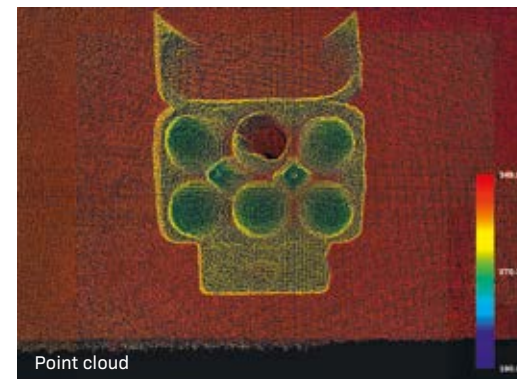
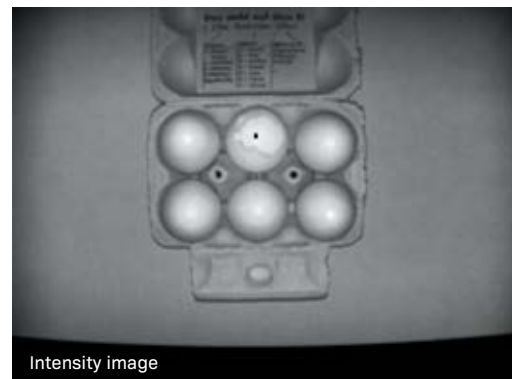


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TIME OF FLIGHT CAMERA OVERVIEW OF THE SERIES



Range	■ AM-T100
Dimensions (W × H × L)	70 × 70 × 72 mm
Sensor technology	iToF (indirect Time-of-Flight)
Range	6 m ¹⁾
Resolution	640 × 480 px
Frame rate	max. 60 fps
Laser diode wave length (nm)	850 nm
Field of view	67° × 51°
Measurement precision	< 1 %
Depth resolution	1 mm
Termination	1x M12 A-coded 8-pole I/O connecting cable 1x M12 X-coded Ethernet connector
Degree of protection	IP67 ²⁾
Features	<ul style="list-style-type: none"> • Sony DepthSense™ technology for millimetre-precise 3D depth images • High frame rate of up to 60 fps • Easy data exchange via standardised data interface GenICam • Software for easy configuration of 3D monitoring areas



¹⁾ Depending on the remission properties of the target objects, a range of up to 30 m can be achieved.

²⁾ If both plug connections are closed.



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tec.nicum – Solutions & Services GmbH is a subsidiary of the Schmersal Group. It offers a wide range of services relating to machine and occupational safety.

tec.nicum consists of a global consultancy network of TÜV Rheinland-certified engineers for functional safety and Machinery CE Experts. The services can be utilised worldwide.

The range of services at tec.nicum is based on six modules: knowledge transfer in the academy section, consultancy services in the consulting section, designing safety solutions in the engineering section, practical implementation in the integration section, the development of software solutions and new digital technologies in the digitalisation section and the provision of complete solutions in the outsourcing section.



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The range of services offered by tec.nicum comprises six segments: academy (knowledge transfer), consulting (advisory services), engineering (technical planning), integration (execution and implementation), digitalisation (software solutions and new digital technologies) as well as outsourcing (complete solutions).

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THE SCHMERSAL GROUP

PROTECTION FOR MAN AND MACHINE

In the demanding field of machine safety, the owner-managed Schmersal Group is one of the international market leaders. The company, which was founded in 1945, has a workforce of about 2,000 people and seven manufacturing sites on three continents along with its own companies and sales partners in more than 60 nations.

Customers of the Schmersal Group include “Global Players” in mechanical engineering and plant manufacturing and operators of machinery. They benefit from the company’s extensive expertise as a provider of systems and solutions for machine safety. In addition, Schmersal specialises in various areas including intralogistics, foodstuff production, the packaging industry, machine tool industry, lift switchgear, heavy industry and the automotive industry.

A major contribution to the systems and solutions offered by the Schmersal Group is made by tec.nicum with its comprehensive range of services: Certified Functional Safety Engineers advise machinery manufacturers and machinery operators in all aspects relating to machinery and occupational safety – and do so with product and manufacturer neutrality.

Furthermore, they design and realise complex solutions for safety around the world in close collaboration with the clients.



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