

Signaling relay RA 32

for surface-mounting,
flush-mounting or plug-in
version direct or in a rack

10/86-6.20 EN



- Semi-automatic flag relay
- Large flag bars 40 mm × 31 mm
Operating position: black
Fault: two white-, one red-hatched bar
Acknowledged fault: three white bars
May additionally be labeled
- Several contact functions available for selection
- Several contact materials available for selection
- Several connection types available for selection
- For DC voltage operation
(also available for DC current operation)
or AC voltage operation (40 to 200 Hz)
If $f > 200$ Hz: operate value rising, release value falling

The RA32 is suited particularly to the display of faults that are still present after detection and manual acknowledgement.

The signaling relay has three optical state indications:

- Operating position
- Fault, not acknowledged
- Fault acknowledged but not remedied
- Fault acknowledged and remedied = operating position

The two contacts allow additional remote signals depending on the selected contact function.



ABB

Technical notes

Signaling relay

Open-circuit system (standard design): An applied energizing quantity (current or voltage) within the guaranteed range produces a magnetic field which in turn causes the magnetic system to operate.

The operate function is ensured from the lowest guaranteed value onwards (but may also occur for lower values). The magnetic function remains in operate condition while the energizing quantity is within the guaranteed range.

The assured release takes place from 5 % (DC) or 15 % (AC) of the highest reference value within the permitted range of the energizing quantity (but may also occur for higher values).

Open-circuit operation: As an energizing quantity is applied and the magnetic system operates, an optical indication is issued.

Closed-circuit operation: As the energizing quantity drops out and the magnetic system no longer operates, an optical indication is issued.

The indication may be acknowledged by pressing a button. Remote signaling can be effected via 2 contacts (function can be selected, see "Operation of flags and contacts").

Optical displays

Operating position: black
Fault, not acknowledged: two white, one red-hatched bar
Acknowledged fault (not remedied): three white bars
Fault acknowledged and remedied = operating position: black
May additionally be labeled.

Contact functions / remote signaling

See "Operation of Flags and Contacts".

Signaling relay, plug-in design

The relay plugs into a matching socket.

Signaling relay, threaded connections

The built-in signaling relay can be directly wired via threaded connections at the rear side. The signaling relay can be mounted on a mounting plane using a surface-mounting socket.

Coil for DC current /DC voltage only

(Coil without auxiliary circuit)

The energizing quantity is applied directly to the coil. There is no auxiliary circuit as protection from transient overvoltages or for the limitation of overvoltages on switch-off. The relay itself is resistant towards transient overvoltages within the guaranteed range.

Coil for DC or AC voltage

(Coil with auxiliary circuit)

The energizing quantity is applied to the coil via a bridge rectifier. The coil circuit is thereby polarity-independent and reverse-polarity-protected at the point of connection. The bridge rectifier simultaneously takes on the function of a free-wheeling diode without polarity dependence. The input circuit is additionally protected by a voltage-dependent resistor (VDR).

Contact material

Our standard contact material is silver that is gold-bloomed for protection during storage. Other contact materials are offered for selection. Please see the Data Sheet 86-1.00 EN for details.

Open-circuit operation

See "Signaling relays", "Operation of flags and contacts" and Illustration 1.

Closed-circuit operation

See "Signaling relays", "Operation of flags and contacts" and Illustration 2.

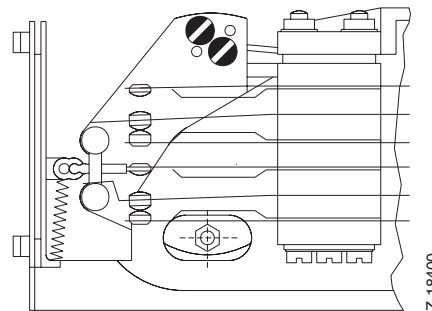


Illustration 1: Open-circuit operation, contacts in operate position

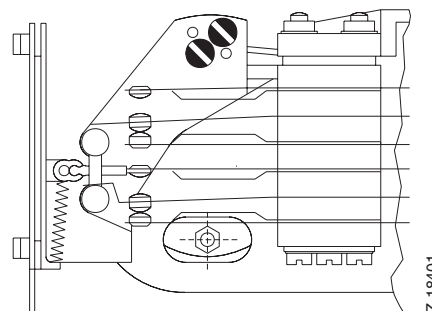


Illustration 2: Closed-circuit operation, contacts in operate position

Special features

Short operate time: This special feature guarantees the operate function in open-circuit operation even for brief transients from approximately 8 ms. The energizing quantity must not persist for more than 1 s.

Without a jumper on terminals 6 and 8: No internal jumper for the contact "break-contact, non-canceling", a modified signal becomes possible.

Break contact, non-canceling instead of make contact: see "Circuit diagrams" and "Operation of flags and contacts".

Technical notes



Rack ER 034
without flush-mounting sockets, for permanent installation of the
signaling relays



Rack ER 134
with built-in flush-mounting sockets

Accessories

Labeling plate:

Transparent plate set in front of the display mask of the signaling relay. Factory-labeling per order or labeling by the customer are both possible. The labeling is visible when the signals 'Fault' and 'Fault acknowledged but not remedied' are issued.

Installation spindle (set of 2):

For mounting, the signaling relays are held firmly in the mounting plane with these 2 spindles.

Flush-mounting plug-in socket:

A signaling relay can be plugged into the built-in plug-in socket.

Surface-mounting base:

Mounted on a signaling relay with threaded terminals. The signaling relay thereby turns into a wall-mounting signaling relay with threaded terminals. The surface-mounting base is installed on the mounting plane with 2 bolts.

Surface-mounting plug-in socket:

Surface-mounting socket, installed on the mounting plane with 2 bolts. Will carry a plug-in signaling relay.

Tool for plug-in relay:

Use to pull out a plugged-in signaling relay.

Rack:

One rack takes up to 12 signaling relays (3 vertical × 4 horizontal). Only a cutout plus bore holes are needed for the rack. The two pre-installed rails are mounted on the panel from the rear using the enclosed bolts. Depending on the panel thickness, the necessary number of washers is set onto the spacer bolt and the frame is then set onto the spacer bolts and bolted on. Thereafter the plastic front frame is set onto the mounting panel and the signaling relays are positioned in the compartments. Any vacant compartments are covered with dummy plates.

Rack ER 034 without flush-mounting socket for permanent installation:

The rack is not fitted with plug-in sockets. It will take signaling relays with threaded connections. The signaling relays are mounted on the carrier rails.

Rail ER 134 with flush-mounting sockets for plug-in mounting:

The rack is fitted with plug-in sockets so as to take plug-in signaling relays. The signaling relays are held firmly in the sockets.

Dummy plates:

These are used to cover any vacant compartments in the racks.

Wiring bolts, wiring rail:

These are used to wire the signaling relays in different wiring levels within an installation box.

Signaling relay RA 32 for surface-mounting, flush-mounting or plug-in version direct or in a rack 10/86-6.20 EN

Technical data (Please note the general hints in the Data Sheet 86-1.00 EN)

General data

Function
Attracted-armature relay with semi-automatic flags

Degree of device protection

Relay
Front: IP 40
Rear: IP 20 (except connections)
Connection area: IP 20 (with cover)

Surface-mounting socket
IP 20 (with cover)

Surface-mounting base
IP 20 (with cover)

Flush-mounting socket
IP 00

Installation

(see "Installation and accessories")

Weight

Relay approx. 340 g
Surface-mounting socket approx. 230 g
Surface-mounting base approx. 130 g
Flush-mounting socket approx. 120 g

Electrical connections

(see also "Circuit diagrams")

Relay plug-in or threaded terminals

Wire, solid bolt, max. 2.5 mm²
Wire, flexible bolt, max. 2.5 mm²
(use wire end ferrules)

Surface-mounting socket

Wire, solid bolt, max. 2.5 mm²
Wire, flexible bolt, max. 2.5 mm²
(use wire end ferrules)

Surface-mounting base

Wire, solid bolt, max. 2.5 mm²
Wire, flexible bolt, max. 2.5 mm²
(use wire end ferrules)

Flush-mounting socket

Wire, solid bolt, max. 2.5 mm²
Wire, flexible bolt, max. 2.5 mm²
(use wire end ferrules)

Shock protection to be ensured through installation!

Mounting orientation
arbitrary

Mechanical service life
5 × 10⁵ switching operations

Permissible switching frequency
200 switching operations/h

Climate class 3K3
max. 85% relative humidity
max. 25 g/m³ abs. humidity

Transport and storage temperature
-45...100 °C

Ambient temperature
-25 ... 65 °C

Maximum surface temperature
+85 °C
(with all maximum permissible values for ambient temperature, coil voltage, contact rating)

Coil circuit		Resistance		Nominal consumption	max. permissible operating range V _{min.} to V _{max.} at ambient temperature		
Nominal voltage	Nominal range	R _{coil}	R _{ser.}		-25 °C...+40 °C	-5 °C...+40 °C	-25 °C...+65 °C
RA 32 (specified operate value 230 AW)							
Coil for DC voltage only							
24 V	19.2... 26.4 V	210 Ω	–	2.74 W	16.2... 37.9 V	16.2... 37.9 V	17.6... 30.6 V
42/48 V	33.6... 52.8 V	700 Ω	–	3.29 W	29.4... 69.1 V	29.4... 69.1 V	32.0... 55.9 V
60 V	48.0... 66.0 V	1500 Ω	–	2.40 W	43.4...101.2 V	43.4...101.2 V	47.1... 81.8 V
100/110/130 V	80.0...143.0 V	4200 Ω	–	2.88 W	70.9...168.1 V	70.9...168.1 V	77.0...143.0 V
220/250 V	176.0...275.0 V	17200 Ω	–	2.81 W	154.9...357.4 V	154.9...357.4 V	153.5...276.9 V
others per order from 5...250 V							
Coil for DC and AC voltage (DC/AC. f = 40...200 Hz)							
24 V	19.2... 26.4 V	210 Ω	–	2.74 W	18.6... 39.1 V	18.6... 39.1 V	19.2... 31.8 V
42/48 V	33.6... 52.8 V	700 Ω	–	2.52 W	31.8... 70.4 V	31.8... 70.4 V	33.6... 57.1 V
60 V	48.0... 66.0 V	1500 Ω	–	2.40 W	45.8...102.4 V	45.8...102.4 V	48.0... 83.0 V
100/110/130 V	80.0...143.0 V	4200 Ω	–	2.88 W	73.3...170.5 V	73.3...170.5 V	79.4...143.0 V
220/230/250 V	176.0...275.0 V	17200 Ω	–	3.08 W	157.3...358.6 V	157.3...358.6 V	155.9...278.1 V
others per order from 12...250 V							

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Technical data (Please note the general hints in the Data Sheet 86-1.00 EN)

Contact circuit

Components and function

RA 32	2 changeover contacts
RA 32 N	1 changeover contact, 1 make contact (non-cancelling)
RA 32 W	1 changeover contact, 1 passing contact
RA 32 NW	1 make contact (non-cancelling), 1 passing contact
RA 32 M	1 changeover contact, 1 automatic changeover contact
RA 32 MW	1 automatic changeover contact, 1 passing contact
RA 32 WA	1 automatic changeover contact, 1 automatic passing contact

Switching times

(see also "Operation of flags and contacts")

Switching times for DC voltage operation (at reference value)			
	w/o free-wheel. diode	with free-wheeling diode	
	make contact	break contact	make contact
Operate time	< 30 ms	< 30 ms	< 30 ms
Release time	< 30 ms	< 30 ms	< 40 ms

Switching times for AC voltage operation (at reference value)			
		with free-wheeling diode	
		make contact	break contact
Operate time	–	< 30 ms	< 30 ms
Release time	–	< 70 ms	< 70 ms

Contacts	Contact material	Contact diameter
Standard	silver, gold-bloomed	3.5 mm
choices	silver-palladium	3.5 mm
	silver-cadmium oxide	3.5 mm
	gold	2.5 mm

Limit values

(Please note restrictions on contact materials and rated voltage.)

Clearance/creepage dist.:	Clearance	Creepage distance
Open contact	≥ 0.9 mm	≥ 4.0 mm
Between contact sets	≥ 3.0 mm	≥ 4.0 mm
Contact/coil	≥ 3.0 mm	≥ 4.0 mm
Contact/mass	≥ 3.0 mm	≥ 4.0 mm
Coil/mass	≥ 3.0 mm	≥ 4.0 mm

Switching voltage	400 V AC/450 V DC
Making current	10 A AC/DC
Continuous current	6 A AC/DC

Breaking capacity	Current	Power
230 V AC $\cos\phi = 0,1...1$	6 A	1380 VA
220 V DC L/R = 0 ms	0.4 A	88 W
110 V DC L/R = 0 ms	0.7 A	77 W
60 V DC L/R = 0 ms	2 A	120 W
220 V DC L/R = 40 ms	0.2 A	44 W
110 V DC L/R = 40 ms	0.35 A	38 W
60 V DC L/R = 40 ms	1 A	60 W

(see also diagrams 1 and 2)

Electrical service life > 10⁴ switching operations

CE classification

Overvoltage category	III
Pollution degree	3
Rated impulse voltage	4 kV
Nominal voltage	250 V AC/DC
E.g. for switching in TN and TT systems	230/400 V

For special designs, the technical data may differ.

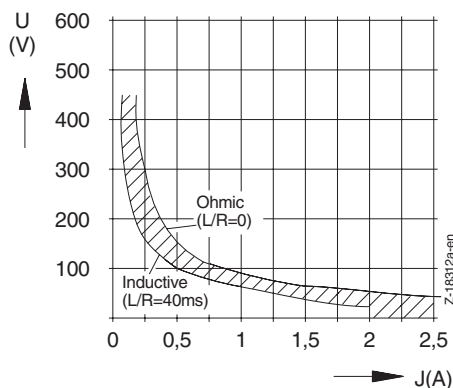


Diagram 1: DC breaking capacity

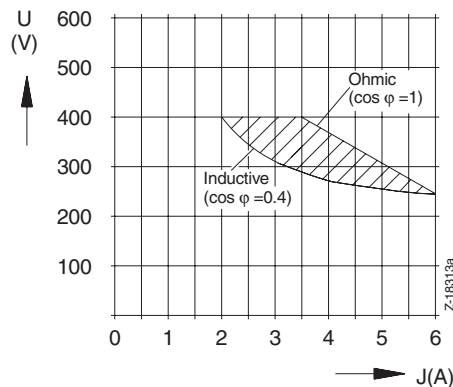












































Diagram 2: AC breaking capacity

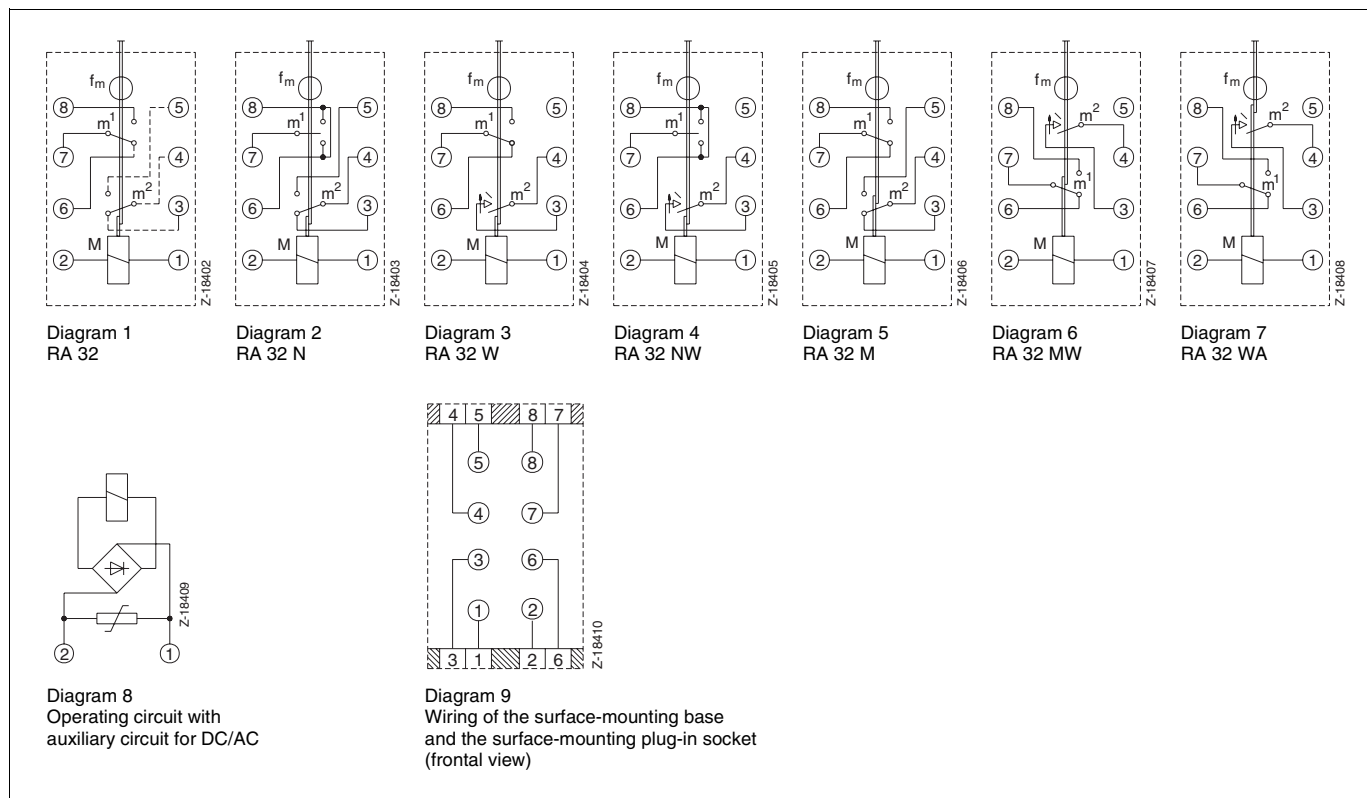
Operation of flags and contacts

	Magnetic system Setting		Flag	Change-over contact	Make contact non-canceling ¹⁾ (N)	Break contact non-cancel. ²⁾ (NU)	Automatic change-over contact ³⁾ (W)	Passing contact ⁴⁾ (W)	Automatic passing contact ⁵⁾ (W)
	Open-circuit system	Closed-circuit system							
Operating position	no current	energized							
Fault start	energized	no current							
Fault end before flag acknowledgement	no current	energized							
New fault before acknowledgement	energized	no current							
Acknowledged fault	energized	no current							
Fault end	no current	energized							

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- ¹⁾ Make contact (non-canceling) opening briefly during acknowledgement.
- ²⁾ Break contact (non-canceling) opening briefly during acknowledgement.
- ³⁾ Automatic changeover contact cannot be reset manually, it indicates the fault duration. It opens briefly during acknowledgement.
- ⁴⁾ The passing contact operates only during the flag transition from operating to signaling position. Contact duration > 20 ms.
- ⁵⁾ The passing contact operates independently of the flag position at the start of a coil energizing event. Contact pulse > 20 ms.

Circuit diagrams

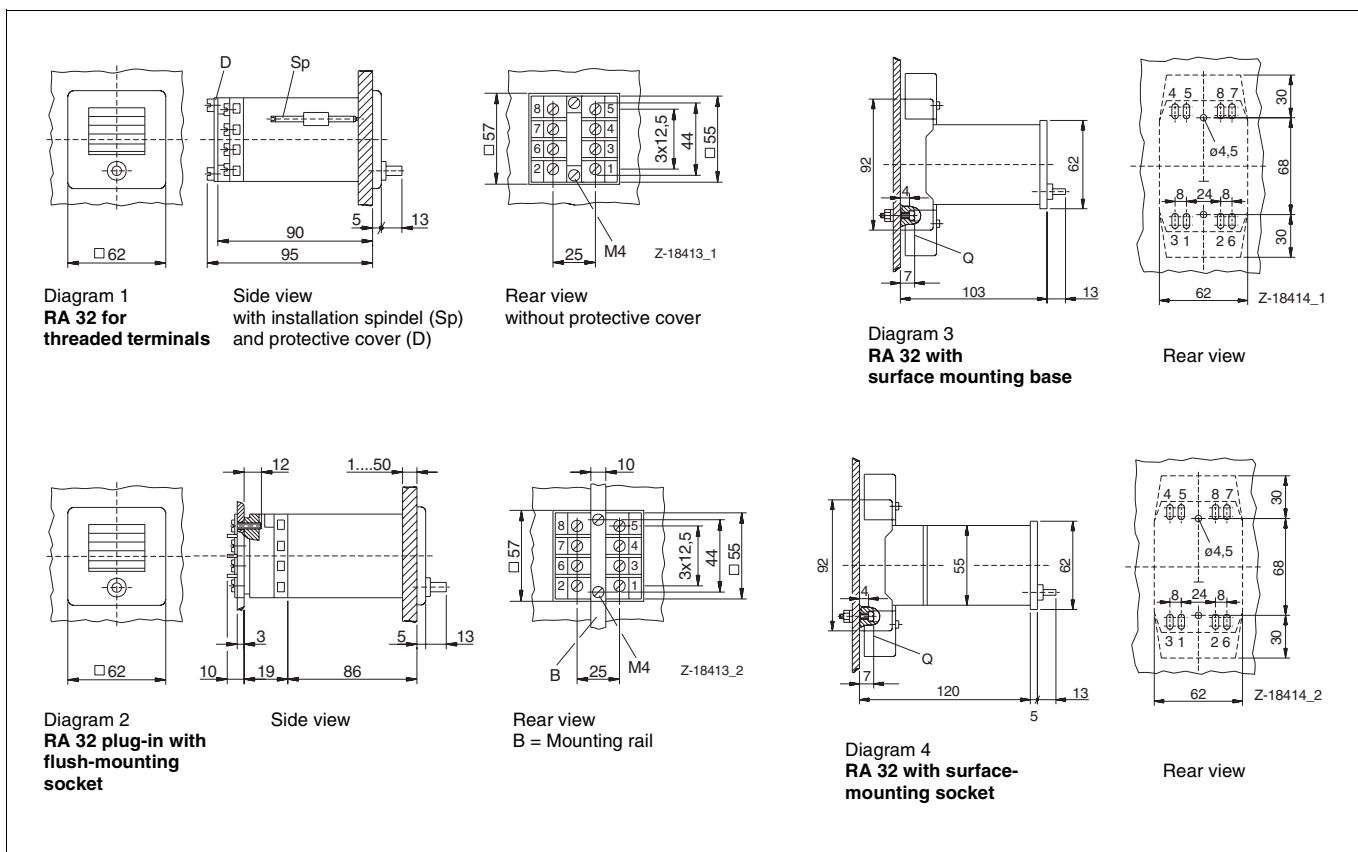


Signaling relay RA 32 for surface-mounting, flush-mounting or plug-in version direct or in a rack 10/86-6.20 EN

Installation and accessories

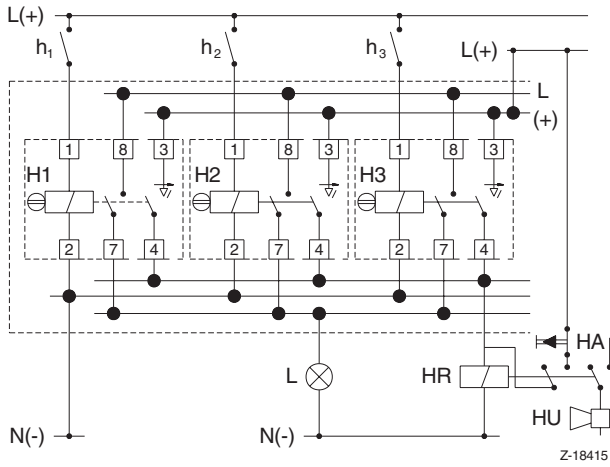
	Type of installation	Signaling relay	Accessories
	Individual installation, permanent	Threaded terminals	Installation spindle
	Individual installation, plug-in	Plug-in	Flush-mounting socket (tool for relay removal)
	Installation of the signaling relays in the rack (3 vertical, 4 horizontal)		Rack
	Signaling relay, permanent installation	Threaded terminals	ER 034
	Signaling relay, plugged in	Plug-in	ER 134 (tool for relay removal)
	Individual surface-mounting, permanent	Threaded terminals	Surface-mounting base
	Individual surface-mounting, plugged in	Plug-in	Surface-mounting socket

Dimensional drawings of the signaling relay RA 32 (dimensions in mm)

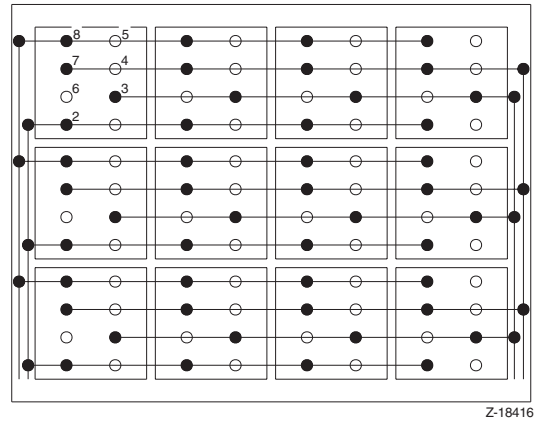


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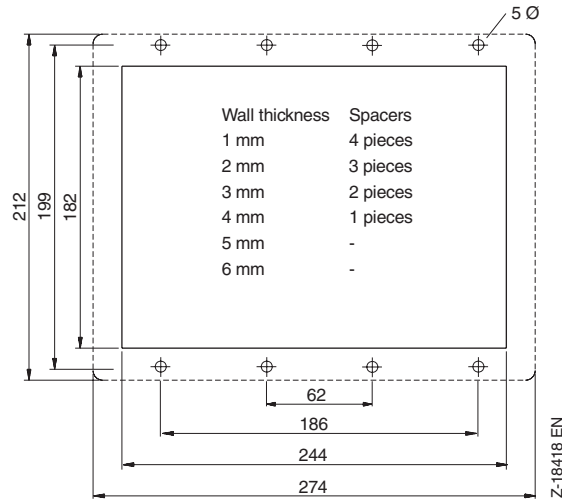
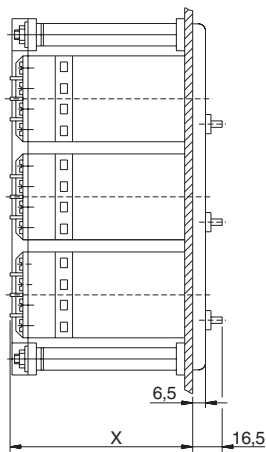
Circuit diagram and dimensional drawing of rack ER (dimensions in mm)



Circuit diagram, example
 h = Fault signaling contact
 L = Lamp for multiple signaling
 HR = Hooter silencing relay
 HA = Hooter silencing key
 H = Signaling relay RA 32 W



Wiring scheme for racks ER 034 or ER 134 fitted with 12 relays RA 32 W



Rack
ER 034 (without socket)
ER 134 (with socket)
 Meas. x = 99 mm without socket
 113 mm with socket

Signaling relay RA 32

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Ordering information for all available designs										
Design						Catalog No.		Code	Circ. diagr.	Dim. draw.
Design						V86618A-				
Signaling relay										
RA 32	2 changeover contacts					2				1
RA 32 N	1 Changeover contact, 1 make contact (no canceling)					3				2
RA 32 W	1 changeover contact, 1 passing contact					4				3
RA 32 NW	1 make contact (no canceling), 1 passing contact					5				4
RA 32 M	1 changeover contact, 1 automatic changeover contact					6				5
RA 32 MW	1 automatic changeover contact, 1 passing contact					7				6
RA 32 WA	1 automatic changeover contact and passing contact each					8				7
Contact material for RA 32, RA 32 W, RA 32 M, RA 32 MW, RA 32 WA										
Silver, gold-bloomed						4				
Silver-palladium						5				
Contact material for RA 32 N, RA 32 NW										
Silver, gold-bloomed						7				
Silver-palladium						8				
Nominal voltage										
without						2	0			
auxiliary circuit						3	0			
24 V DC						4	0			
42/48 V DC						5	0			
60 V DC						6	0			
100/110/130 V DC						7	0			
220/250 V DC						8	0			
..... V DC ^{1) 5)}						9	0		501	
with bridge										
24 V AC / DC						0	2			8
rectifier						0	3			8
and protective						0	4			8
circuitry						0	5			8
100/110/130 V AC / DC						0	7			8
220/230/250 V AC / DC						0	9		501	8
..... V AC / DC ^{1) 5)}										
Connection										
Threaded terminal ends							1			1
Plug-in connectors							2			2
Operating mode										
open-circuit system							3			
closed-circuit system							4			
Special features										
None							0			
Short operate time (approx. 8 ms), make-time max. 1 s ⁵⁾							3	2		
(DC design only possible for RA32, RA32W, RA32N, RA32NW, RA32M)										
Without bridge between terminals 6 and 8 (possible for RA32N and RA32NW only)								3		
Break contact (no canceling) instead of make contact (possible for RA32N and RA32NW only)								4		

¹⁾ Customer-specific within the realm of technical feasibility as per Catalog 86!

State nominal voltage / nominal current of the coil.

Possible nominal voltages: 5 to 250 V DC und 12 to 250 V AC

⁵⁾ Technical date may change compared to the standard design as per Catalog specifications.

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Standard designs				
Design	Nominal voltage	Catalog No.	Circ. diagr.	Dim. draw.
Signaling relay RA 32	24 V DC	V86618A-2420130	1	1
2 changeover contacts,	42/48 V DC	V86618A-2430130	1	1
contact material	60 V DC	V86618A-2440130	1	1
silver, gold-bloomed,	100/110/130 V DC	V86618A-2450130	1	1
threaded terminal ends,	220/250 V DC	V86618A-2470130	1	1
open-circuit system	24 V DC / AC	V86618A-2402130	1 and 8	1
	42/48 V DC / AC	V86618A-2403130	1 and 8	1
	60 V DC / AC	V86618A-2404130	1 and 8	1
	100/110/130 V DC / AC	V86618A-2405130	1 and 8	1
	220/230/250 V DC / AC	V86618A-2407130	1 and 8	1
Signaling relay RA 32 N	24 V DC	V86618A-3720130	2	1
1 changeover contact,	42/48 V DC	V86618A-3730130	2	1
1 make contact	60 V DC	V86618A-3740130	2	1
(no canceling),	100/110/130 V DC	V86618A-3750130	2	1
contact material	220/250 V DC	V86618A-3770130	2	1
silver, gold-bloomed,	24 V DC / AC	V86618A-3702130	2 and 8	1
threaded terminal ends,	42/48 V DC / AC	V86618A-3703130	2 and 8	1
open-circuit system	60 V DC / AC	V86618A-3704130	2 and 8	1
	100/110/130 V DC / AC	V86618A-3705130	2 and 8	1
	220/230/250 V DC / AC	V86618A-3707130	2 and 8	1
Signaling relay RA 32 W	24 V DC	V86618A-4420130	3	1
1 changeover contact,	42/48 V DC	V86618A-4430130	3	1
1 passing contact,	60 V DC	V86618A-4440130	3	1
contact material	100/110/130 V DC	V86618A-4450130	3	1
silver, gold-bloomed,	220/250 V DC	V86618A-4470130	3	1
threaded terminal ends,	24 V DC / AC	V86618A-4402130	3 and 8	1
open-circuit system	42/48 V DC / AC	V86618A-4403130	3 and 8	1
	60 V DC / AC	V86618A-4404130	3 and 8	1
	100/110/130 V DC / AC	V86618A-4405130	3 and 8	1
	220/230/250 V DC / AC	V86618A-4407130	3 and 8	1
Signaling Relay RA 32 NW	24 V DC	V86618A-5720130	4	1
1 make contact	42/48 V DC	V86618A-5730130	4	1
(no canceling),	60 V DC	V86618A-5740130	4	1
1 passing contact,	100/110/130 V DC	V86618A-5750130	4	1
contact material	220/250 V DC	V86618A-5770130	4	1
silver, gold-bloomed,	24 V DC / AC	V86618A-5702130	4 and 8	1
threaded terminal ends,	42/48 V DC / AC	V86618A-5703130	4 and 8	1
open-circuit system	60 V DC / AC	V86618A-5704130	4 and 8	1
	100/110/130 V DC / AC	V86618A-5705130	4 and 8	1
	220/230/250 V DC / AC	V86618A-5707130	4 and 8	1
Signaling relay RA 32 M	24 V DC	V86618A-6420130	5	1
1 changeover contact,	42/48 V DC	V86618A-6430130	5	1
1 automatic	60 V DC	V86618A-6440130	5	1
changeover contact,	100/110/130 V DC	V86618A-6450130	5	1
contact material	220/250 V DC	V86618A-6470130	5	1
silver, gold-bloomed,	24 V DC / AC	V86618A-6402130	5 and 8	1
threaded terminal ends,	42/48 V DC / AC	V86618A-6403130	5 and 8	1
open-circuit system	60 V DC / AC	V86618A-6404130	5 and 8	1
	100/110/130 V DC / AC	V86618A-6405130	5 and 8	1
	220/230/250 V DC / AC	V86618A-6407130	5 and 8	1

Signaling relay RA 32

for surface-mounting, flush-mounting or plug-in version direct or in a rack 10/86-6.20 EN

Standard designs (continued)				
Design	Nominal voltage	Catalog No.	Circ. diagr.	Dim. draw.
Signaling relay RA 32 MW	24 V DC	V86618A-7420130	6	1
1 automatic	42/48 V DC	V86618A-7430130	6	1
changeover contact,	60 V DC	V86618A-7440130	6	1
1 passing contact,	100/110/130 V DC	V86618A-7450130	6	1
contact material	220/250 V DC	V86618A-7470130	6	1
silver, gold-bloomed,	24 V DC / AC	V86618A-7402130	6 and 8	1
threaded terminal ends,	42/48 V DC / AC	V86618A-7403130	6 and 8	1
open-circuit system	60 V DC / AC	V86618A-7404130	6 and 8	1
	100/110/130 V DC / AC	V86618A-7405130	6 and 8	1
	220/230/250 V DC / AC	V86618A-7407130	6 and 8	1
Signaling relay RA 32 WA	24 V DC	V86618A-8420130	7	1
1 automatic changeover	42/48 V DC	V86618A-8430130	7	1
and passing contact each,	60 V DC	V86618A-8440130	7	1
contact material	100/110/130 V DC	V86618A-8450130	7	1
silver, gold-bloomed,	220/250 V DC	V86618A-8470130	7	1
threaded terminal ends	24 V DC / AC	V86618A-8402130	7 and 8	1
open-circuit system	42/48 V DC / AC	V86618A-8403130	7 and 8	1
	60 V DC / AC	V86618A-8404130	7 and 8	1
	100/110/130 V DC / AC	V86618A-8405130	7 and 8	1
	220/230/250 V DC / AC	V86618A-8407130	7 and 8	1

Accessories for signaling relays RA 32				
Description		Catalog No.	Circ. diagr.	Dim. draw.
Labeling plate	unlabeled	V86610A-1810000		
	1 line of labeling	V86610A-1820000		
	2 lines of labeling	V86610A-1830000		
	3 lines of labeling	V86610A-1840000		
Flush-mounting spindle (1 set)		V86610A-1200000		
Flush-mounting plug-in case		V86610A-1300000		
Surface-mounting base		V86610A-1400000	9	3
Surface-mounting plug-in case		V86610A-1500000	9	4
Key for plug-in relays		V86610A-1060000		

Signaling relay RA 32
for surface-mounting, flush-mounting or plug-in version direct or in a rack 10/86-6.20 EN

Racks ER for signaling relays RA 32			
Design	Catalog No.		Dim. draw.
Rack ER 034 without flush-mounting case, for permanent installation of 12 signaling relays: 3 x vertical, 4 x horizontal	V86611A-1200000		5
Rack ER 134 with built-in plug-in case for 12 signaling relays 3 x vertical, 4 x horizontal	V86611A-2020000		5

Accessories for racks			
Description	Catalog No.		
Blind flange complete (instead of signaling relay) for ER 034	V86610A-1051000		
Blind flange complete (instead of signaling relay) for ER 134	V86610A-1052000		
Wiring pin 15 mm	V86610A-1073000		
Wiring pin 25 mm	V86610A-1074000		
Wiring pin 35 mm	V86610A-1075000		
Wiring rail	V86610A-1080000		



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