ENGINEERING TOMORROW

Data sheet

# Cartridge pressure switch
## Type ACB and CCB



Pressure controls ACB and CCB are compact disc type pressure switches with fixed set-points for long-standing use in refrigeration and air conditioning systems. They provide automatic or manual reset limit protection.

The small size, lightness and high degree of protection means that it can be mounted directly on the refrigeration systems.

The cartridge switch is available with different pressure settings and pressure connections to suit customer requirements.

All these features reduce installation costs and save space.

**Features**

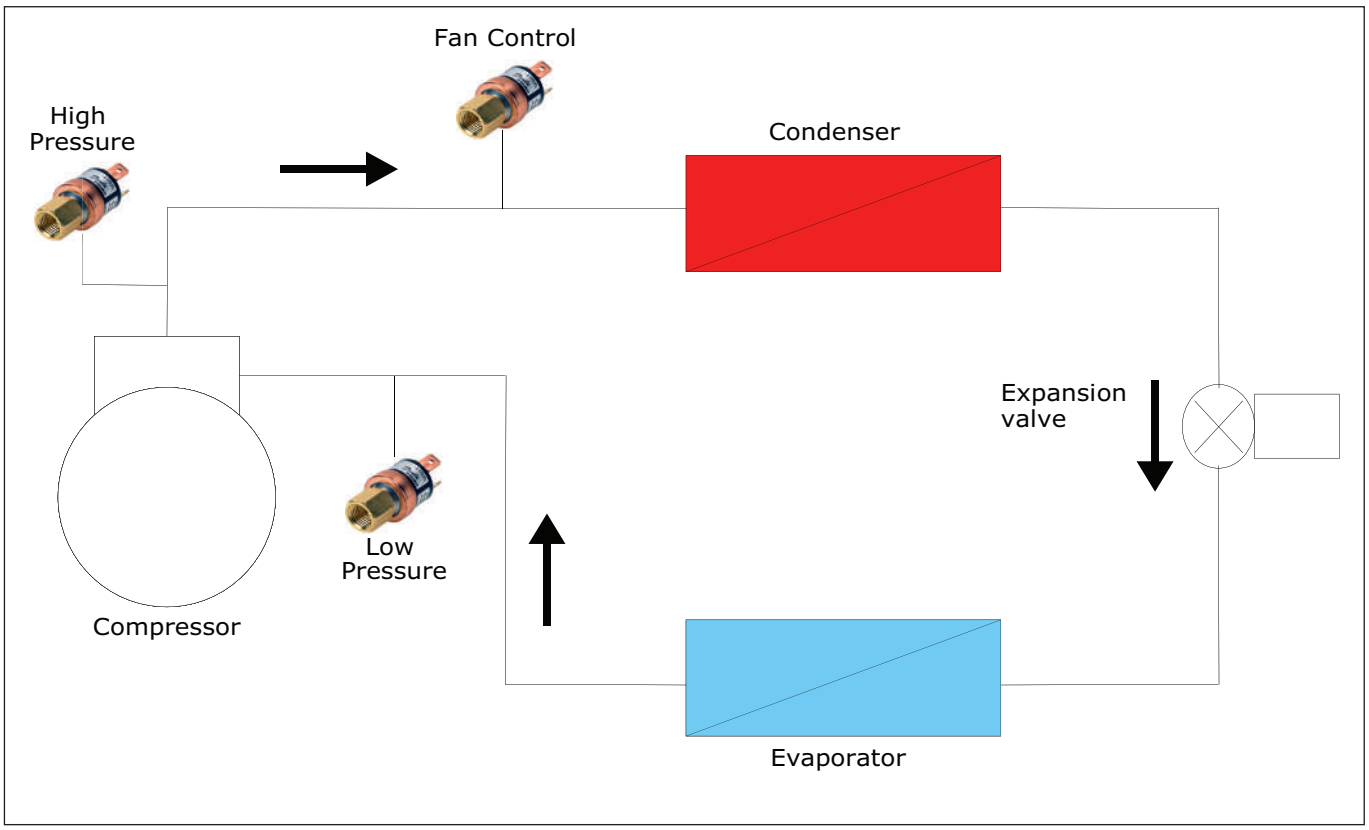
- Wide range
- Fixed pressure set points
- Normally Closed, Normally Open or SPDT contact system
- Automatic or manual reset
- Various port fittings for soldering or direct mounting
- Spades or cables
- Stripped ends or customer specific electrical plug
- Open or water-proof (IP65) version
- Type ACB for use as high and low pressure cut in and cut out as well as fan cycling
- Type CCB available for $CO_2$ refrigerants
- Compact design and easy to install

**Approvals**

- CE according to EN 12263
- Technical Inspection Association TÜV
  TUV certificate no. 01 202 931/Q-04 0018 and 01 202 971/B-17-0002
- Low Voltage Directive 2014/35/EU
- UL recognized (type ACB only):

  - UL 873 and CSA C22.2 No. 24-93
  - UL 121201 and CSA C22/2 No.213-17 (for flammable refrigerants only)

**Air conditioning and Refrigeration**




**Applications**

- Condenser fan switch
- Compressor stop – start
- Pump-down switch
- Low Pressure safety pressure switch
- High Pressure safety pressure switch


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## Technical data

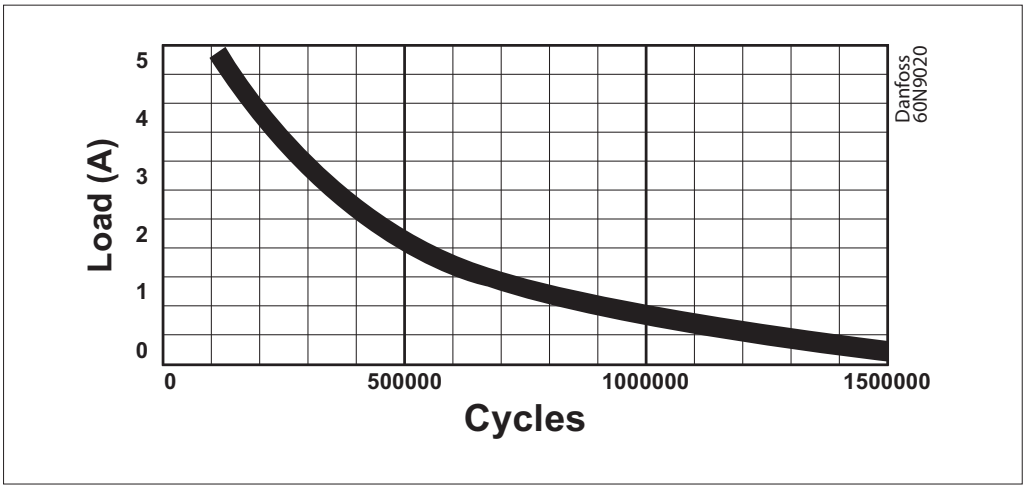
| Type | ACB | | CCB |
|---|---|---|---|
| | **Water-proof (W)** | **Open – spade connector (O)** | **Water-proof (W)** |
| **Medium** | R22, R134a, R404A, R407C, R407F, R410A, R438A, R448A, R449A, R452A, R513A<br>For flammable refrigerants please contact your nearest Danfoss office.<br>For complete list of approved refrigerants, visit www.products.danfoss.com and search for individual code numbers, where refrigerants are listed as part of technical data | | R744 ($CO_2$) |
| **Range** | -0.5 – 45 bar<br>-7 – 652 psi | | 100 – 150 bar<br>1450 –2176 psi |
| **Reset** | Automatic, Manual | Automatic | |
| **Contact function** | SPST-NO, SPST-NC, SPDT | | SPST-NC |
| **Electrical connections** | AWG18 cables | Spades (size 6.35mm x 0.8 mm) | AWG18 cables |
| **Cable length** | 150 cm (black) | – | 150 cm (black) |
| **Contact load** | 6 A @ 250 V AC for SPST | | |
| | 4 A @ 250 V AC for SPDT | | – |
| | 0,01 - 0,05 A @ 12/24 V DC | | |
| **Pressure connections** | 1/4 in ODM solder | | 6.35 mm solder |
| | 6 mm ODM solder | | |
| | 1/4 in SAE female flare | | |
| | with depressure pin | | |
| **Maximum working pressure PS / MWP** | 45 bar<br>650 psi | | 165 bar<br>2393 psi |
| **Burst pressure** | 140 bar<br>2030 psi | | 375 bar<br>5440 psi |
| **Media temperature** | -55 – 135 °C<br>-67 – 275 °F | | -30 – 100 °C<br>-20 – 210 °F |
| **Ambient temperature** | -30 – 85 °C | | |
| **Enclosure** | IP65 | No electrical protection | IP65 |

Customer specific features are available in a wide selection.
Please refer to Specification Build-up on page 8.

## Lifetime

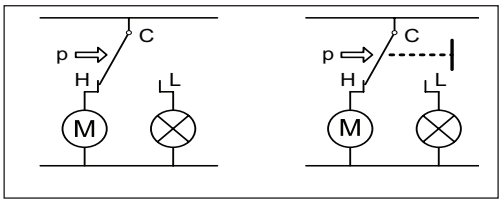
**Switch type:**
SPST auto reset, Normally open
Pressure setting : max 3 MPa

As general rule, ACB pressure switches are capable to cover applications requiring cycling from 100000 to 1500000 cycles dependent on current load. The exact number of cycles in any of given application is to be determined by appropriate testing.
Danfoss-Saginomiya reserves the right to change or modify specifications at any time without prior notice.




SPST auto reset, Normally close – up to 100000 cycles
SPST manual reset, Normally close – 10000 cycles
SPDT auto reset – up to 100000 cycles
SPDT manual reset – 10000 cycles

## Electrical connections



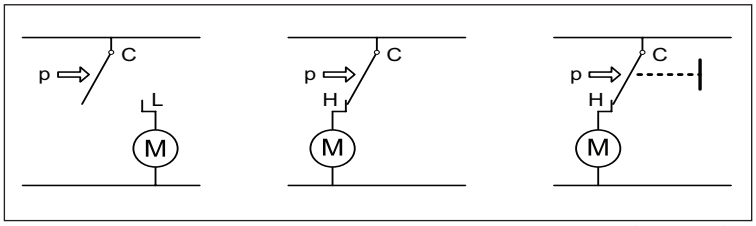

*SPDT*




*SPDT with manual reset*

SPST - Single Pole Single Throw
SPDT - Single Pole Double Throw

(NO) - Normally Open
(NC) - Normally Closed




*SPST NO*

*SPST NC*

*SPST with manual reset*


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## Standard models

*Type ACB*



| Application | Reset | Cut out [bar] [psi] | Cut in [bar] [psi] | Contact system / enclosure type W-water-proof types with cable (IP65) O-open (spade connector) types / no cable (IP00) | Connection type: Solder 6 mm | Connection type: Solder ¼ in | Connection type: Flare 7/16-20 UNF with depressure pin |
|---|---|---|---|---|---|---|---|
| High pressure cut out | Auto. | 18 ± 0.7<br>260 ± 10 | 13 ± 1.2<br>190 ± 17 | SPST-NC / W | **061F7504**<br>ACB-2UB504W | **061F7505**<br>ACB-2UB505W | **061F7506**<br>ACB-2UB506W |
| | | | | SPDT / W | – | – | **061F9057**<br>ACB-2UC59W |
| | | 20 ± 1<br>290 ± 14 | 16 ± 1.5<br>230 ± 21 | SPST-NC / O | – | **061F8710**<br>ACB-2UB210 | **061F8708**<br>ACB-2UB208 |
| | Auto. | 23 ± 0.7<br>335 ± 10 | 19 ± 1.2<br>275 ± 17 | SPST-NC / W | – | – | **061F8494**<br>ACB-2UB465W |
| | | | | SPST-NC / O | – | **061F8707**<br>ACB-2UB207 | **061F8703**<br>ACB-2UB203 |
| | | | | SPDT / W | – | – | **061F9056**<br>ACB-2UC58W |
| | Man. | | | | – | – | **061F9243**<br>ACB-2UC63MW |
| | Auto. | 26 ± 1<br>380 ± 15 | 20 ± 1.5<br>290 ± 22 | SPST-NC / W | **061F7507**<br>ACB-2UB507W | **061F7508**<br>ACB-2UB508W | **061F7509**<br>ACB-2UB509W |
| | | | | SPST-NC / O | – | **061F8705**<br>ACB-2UB205 | **061F8701**<br>ACB-2UB201 |
| | Man. | | | SPST-NC / W | **061F9703**<br>ACB-2UB803MW | **061F9714**<br>ACB-2UB814MW | **061F9713**<br>ACB-2UB813MW |
| | Auto. | | | SPDT / W | – | – | **061F9055**<br>ACB-2UC57W |
| | Auto. | 28 ± 1<br>405 ± 14 | 21 ± 1.5<br>305 ± 22 | SPST-NC / W | **061F7510**<br>ACB-2UB510W | **061F7513**<br>ACB-2UB513W | **061F7514**<br>ACB-2UB514W |
| | Man. | | | | – | – | **061F9522**<br>ACB-2UB327MW |
| | Auto. | | | SPST-NC / O | – | **061F8704**<br>ACB-2UB204 | **061F8700**<br>ACB-2UB200 |
| | Auto. | | | SPDT / W | – | – | **061F9054**<br>ACB-2UC56W |
| | Man. | | | SPDT / W | – | – | **061F9242**<br>ACB-2UC62MW |
| | Auto. | 31 ± 1<br>405 ± 14 | 24 ± 1.5<br>350 ± 22 | SPST-NC / W | **061F8493**<br>ACB-2UB464W | – | **061F8492**<br>ACB-2UB463W |
| | | | | SPST-NC / O | – | **061F8706**<br>ACB-2UB206 | **061F8702**<br>ACB-2UB202 |
| | | | | SPDT / W | – | | **061F9053**<br>ACB-2UC55W |
| | Auto. | 42 ± 1.2<br>610 ± 17 | 33 ± 2<br>480 ± 29 | SPST-NC / W | **061F7515**<br>ACB-2UB515W | **061F7516**<br>ACB-2UB516W | **061F7517**<br>ACB-2UB517W |
| | Man. | | | | – | – | **061F9575**<br>ACB-2UB461MW |
| | Auto. | | | SPDT / W | – | – | **061F9052**<br>ACB-2UC54W |

* Other code numbers are available upon request.

## Standard models
*(continued)*

| Application | Reset | Cut out [bar] [psi] | Cut in [bar] [psi] | Contact system / enclosure type W-water-proof types with cable (IP65) O-open (spade connector) types / no cable (IP00) | Connection type: Solder 6 mm | Connection type: Solder ¼ in | Connection type: Flare 7/16-20 UNF with depressure pin |
|---|---|---|---|---|---|---|---|
| Low pressure control | Auto. | 0.5 ± 0.4<br>7 ± 6 | 1.5 ± 0.5<br>22 ± 4 | SPST-NO / W | **061F7518**<br>ACB-2UA518W | **061F7519**<br>ACB-2UA519W | **061F7520**<br>ACB-2UA520W |
| | | | | SPST-NO / O | – | **061F7402**<br>ACB-2UA152 | **061F7400**<br>ACB-2UA150 |
| | | | | SPDT / O | – | **061F9106**<br>ACB-2UC106 | **061F9102**<br>ACB-2UC102 |
| | Auto. | 0.7 ± 0.5<br>10 ± 7 | 1.7 ± 0.4<br>25 ± 6 | SPST-NO / W | **061F7521**<br>ACB-2UA521W | **061F7522**<br>ACB-2UA522W | **061F7523**<br>ACB-2UA523W |
| | | | | SPDT / W | – | – | **061F9058**<br>ACB-2UC60W |
| | Auto. | 1.7 ± 0.5<br>25 ± 7 | 2.7 ± 0.4<br>39 ± 6 | SPST-NO / W | **061F7524**<br>ACB-2UA524W | **061F7525**<br>ACB-2UA525W | **061F7526**<br>ACB-2UA526W |
| | Auto. | 2.2 ± 0.3<br>32 ± 4.5 | 3.4 ± 0.3<br>50 ± 4.5 | SPST-NO / W | **061F7418**<br>ACB-2UA711W | – | – |
| Fan control | Auto. | 8.5 ± 1.2<br>125 ± 17 | 11 ± 0.8<br>160 ± 12 | SPST-NO / W | **061F8491**<br>ACB-2UA393W | – | **061F8490**<br>ACB-2UA392W |
| | | 13 ± 1.5<br>190 ± 22 | 16 ± 1<br>230 ± 14 | | **061F8334**<br>ACB-2UA306W | – | **061F8333**<br>ACB-2UA305W |

*Type CCB*



| Application | Reset | Cut out [bar] [psi] | Cut in [bar] [psi] | Contact system / enclosure type W-water-proof types with cable (IP65) | Connection type: Solder 6.35 mm, Packing 100 pcs. | Connection type: Solder 6.35 mm, Packing 20 pcs. |
|---|---|---|---|---|---|---|
| High pressure control | Auto. | 100±10<br>1450±145 | 70±20<br>1015±290 | SPST-NC / W | **061F9808**<br>CCB-2UB03W | **061F9908**<br>CCB-2UB03W |
| | | 110±10<br>1595±145 | 80±20<br>1160±290 | | **061F9809**<br>CCB-2UB04W | **061F9909**<br>CCB-2UB04W |
| | | 120±10<br>1740±145 | 90±20<br>1305±290 | | **061F9810**<br>CCB-2UB05W | **061F9910**<br>CCB-2UB05W |
| | | 130±10<br>1885±145 | 100±20<br>1450±290 | | **061F9811**<br>CCB-2UB06W | – |
| | | 140±10<br>2030±145 | 100±20<br>1450±290 | | **061F9812**<br>CCB-2UB07W | – |
| | | 150±10<br>2175±145 | 100±20<br>1450±290 | | **061F9813**<br>CCB-2UB08W | – |


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## Design / Function

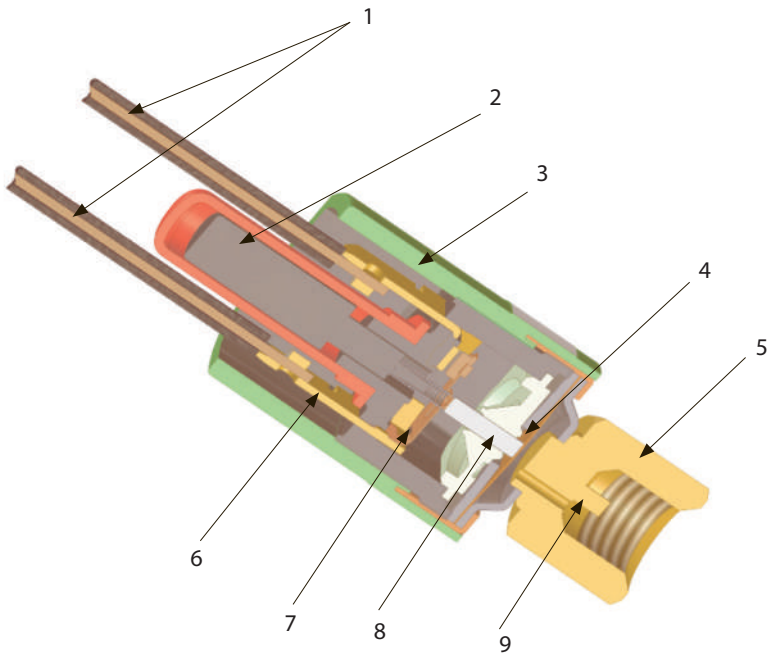



*Fig. ACB - SPST manual reset*

1. Wires
2. Reset button
3. Water-proof casing
4. Diaphragm
5. Pressure connection (¼ in female flare)
6. Electrical terminals
7. Micro-switch
8. Shaft
9. Depressure pin

As pressure is applied through the connection on to the diaphragm, the diaphragm is pushed up against the operation shaft.

When the operation shaft rises, it pushes up the contact plate, so that contacts become connected (in normally open) or disconnected (in normally closed).

As the pressure in the connection decreases, the diaphragm returns to its original state, and the operation shaft lowers, causing the contact plate to return to its original position.

## Special accessories

A wide variety of cartridge switches are available with open enclosure - no electric protection. For these switches a water-proof rubber plug has been specially designed.

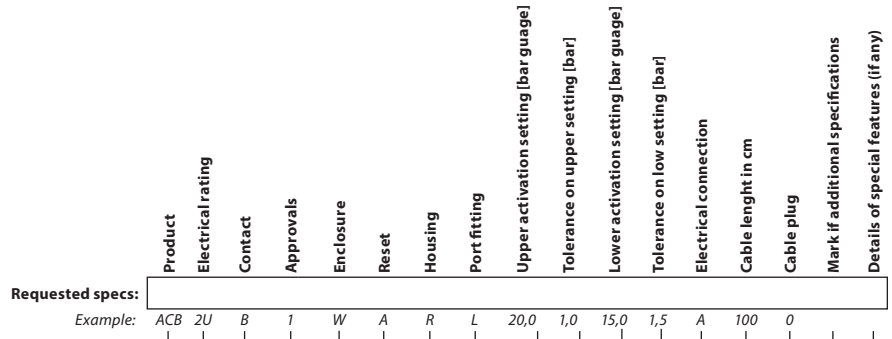
When the plug is installed on the switch a water-proof seal IP64 is obtained. The water-proof rubber plug is available with many different cable lengths.



| Standard cable length [m]* | Packing quantity | Code no. |
|---|---|---|
| 2.5 | 100 | **061F1302** |
| 6 | 100 | **061F1304** |

* other cable lengths available upon request

## Specification build up
## Type ACB

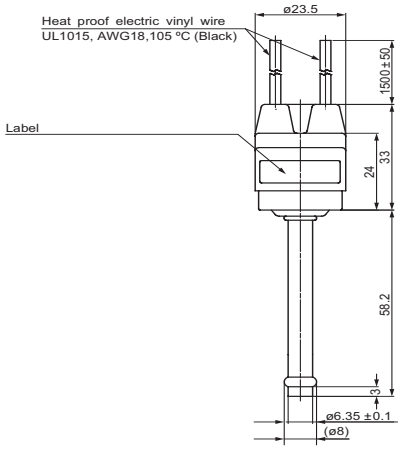



| Field | Code | Explanation |
|---|---|---|
| **Product** | | |
| **Electrical rating** | | |
| | 1U | 1A @ 250V AC |
| | 2U | 6A @ 250V AC (SPST), 4A @ 250V AC (SPDT) |
| | 4U | 0,05A @ 12/24V DC (gold contacts) |
| **Contact** | | |
| | A | SPST-NO |
| | B | SPST-NC |
| | C | SPDT |
| **Approvals** | | |
| | 0 | CE [category II] approval |
| | 1 | CE [category II + IV], TÜV, VDE, UL & C-UL approvals (only with ACB) |
| | 2 | UL & C-UL approvals (only with ACB) |
| | 3 | CE [category II + IV] approval (only with ACB) |
| **Enclosure** | | |
| | O | Open |
| | W | Waterproof IP65 (only with cables) |
| **Reset** | | |
| | A | Automatic |
| | M | Manual (not SPST-NO; SPDT only in Panel mount housing) |
| **Housing** | | |
| | R | Regular hot-melt |
| | E | Epoxy type |
| | P | Panel mount (mandatory for SPDT Manual reset versions) |
| **Port fitting** | | |
| | M | 1/4" SAE female flare w. deflator |
| | V | 1/4" SAE female flare w. 1mm deflator |
| | H | 1/4" SAE male flare |
| | P | 1/4" solder Cu-tube (tip = 3 mm) |
| | X | 1/4" solder Cu-tube (tip = 7 mm) |
| | S | 1/4" solder Cu-tube (no tip) |
| | L | 6 mm solder Cu-tube (tip = 7mm) |
| | E | 1/8-27 NPT male |
| | Y | R (PT) 1/8" |
| **Upper activation setting [bar guage]** | | |
| | --,- | |
| **Tolerance on upper setting [bar]** | | |
| | -,- | +/- indicated value |
| **Lower activation setting [bar guage]** | | |
| | --,- | |
| **Tolerance on low setting [bar]** | | |
| | -,- | +/- indicated value |
| **Electrical connection** | | |
| | A | AWG18 cables |
| | B | AWG16 cables |
| | C | AWG18 (UL 3173) cables |
| | S | 90 deg. spades |
| | D | Double insulated AWG18 cables |
| | V | Double insulated H05VV5-F 2-in-1 cable (on request only, E housing only, Automatic reset only) |
| | R | Double insulated H05RNF 2-in-1 cable (on request only, E housing only, Automatic reset only) |
| | P | AWG18 with PVC tube |
| | H | AWG18 halogen free (RoHS compliant, currently E housing only) |
| **Cable lenght in cm** | | |
| | --- | Please use one of standard lengths: 020, 050, 080, 100, 150, 200 & 250 cm |
| **Cable plug** | | |
| | | (Leave blank if no cable) |
| | 0 | Cut ends |
| **Faston** | A | A1: AMP 170213-2, A2: AMP 170213-2, A3: OBR#250, A4: AMP 735222-2+AMP 735222-2, A5: AMP 170183-2, A6: AMP 170213-2 |
| **AMP** | B | B1: AMP 350777-1, B2: AMP 282080-1, B3: AMP 282104-1, B4: AMP 192167-2, B5: AMP 881772-1, B6: AMP 174354-2 |
| **Molex** | M | M1: 5557-02R |
| **Pin connector** | P | P1: Phoenix 3200250, P2: AMP 350218-1, P3: AMP 170213-2+AMP 926933-1, P4: AMP 926882-1, P5: AMP 165590-1 |
| **Packard** | Q | Q1: 12010973, Q2: 12015792, Q3: 15300002, Q4: 15300027, Q5: 12020829 |
| **Stripped end** | S | S1: stripped ends 15mm, S2: stripped ends 10mm |
| **VHR** | V | V1: VHR-2N, V2: VHR-3N |
| **WAGO** | W | W1: 231-302/026-000, W2: 769-102/021-000 |
| **Additional features** | | |
| | | Leave blank if no additional specifications |
| | X | Please specify (clear text attachment) |
| **Details of special features (if any)** | | |


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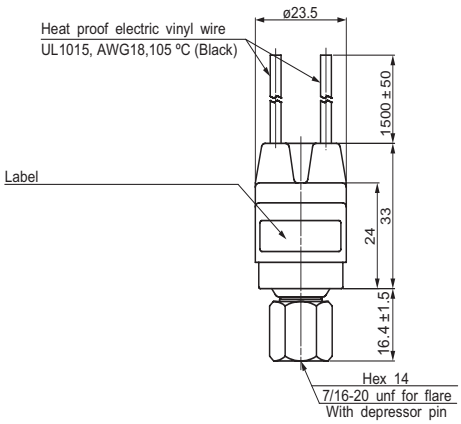
## Dimensions [mm] and weights [kg]

*Type ACB – SPST water-proof with automatic reset ¼ in solder type*



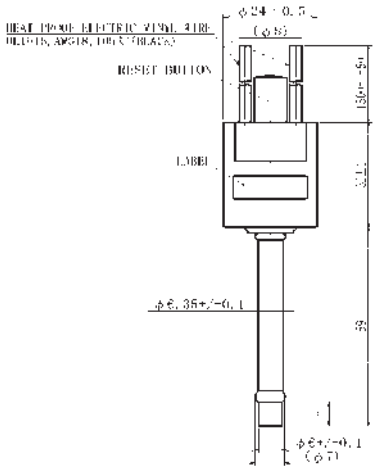

*Net weight 0.072 kg*

*Type ACB – SPST water-proof with automatic reset female flare*



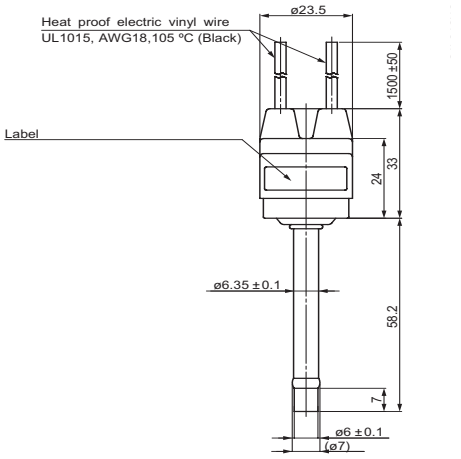

*Net weight 0.080 kg*

*Type ACB – SPST water-proof with manual reset solder type*



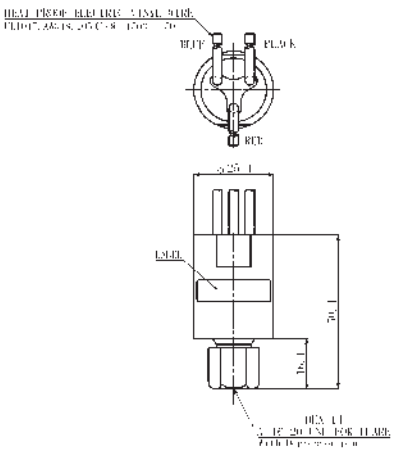

*Net weight 0.078 kg*

*Type ACB – SPST water-proof with automatic reset 6 mm solder type*



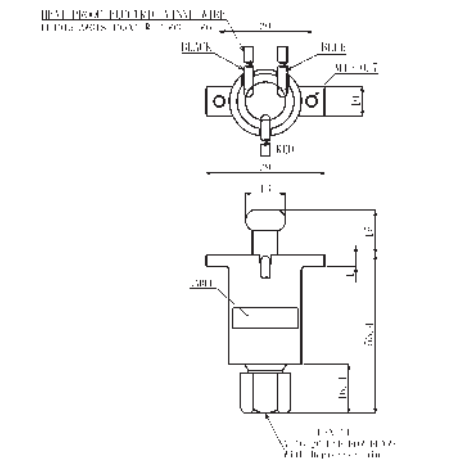

*Net weight 0.072 kg*

*Type ACB – SPDT with automatic reset*




*Net weight 0.114 kg*

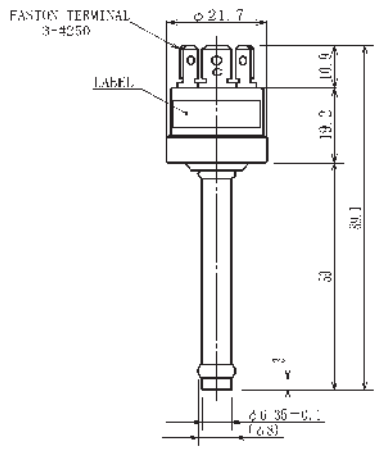
*Type ACB –SPDT with manual reset*




*Net weight 0.112 kg*

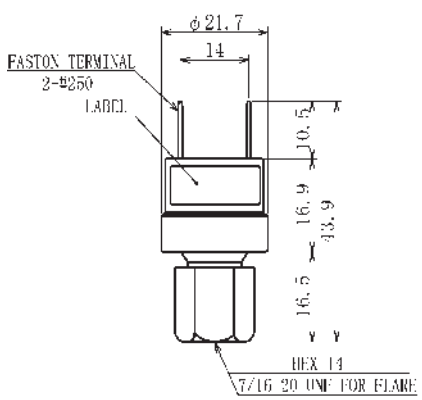
**Dimensions [mm] and weights [kg]**
*(continued)*

*Type ACB – SPDT open type solder type*



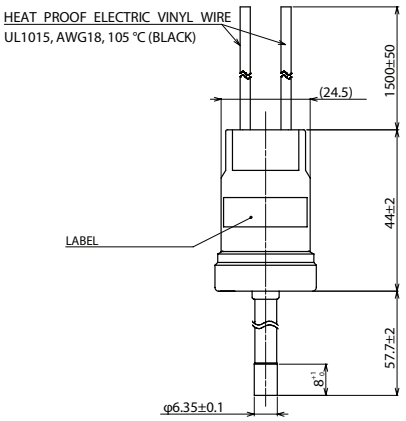

*Net weight 0.024 kg*

*Type ACB – SPST open type with female flare*




*Net weight 0.029 kg*

*Type CCB - SPST water-proof with automatic reset 6.35 mm solder type*




*Net weight 0.125 kg*

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