

# Paddle flow switch

Inline G 1/4" to G 1 1/2" and insertion version for DN 50 to DN 150, brass or stainless steel

Series: S-PKXQ



## Overview

|                       |                                                                             |
|-----------------------|-----------------------------------------------------------------------------|
| Product type          | Paddle flow switch with adjustable reed contact                             |
| Medium                | Water, water-based liquids, oils and coolants (low viscosity)               |
| Inline versions       | G 1/4" to G 1 1/2" female thread, 2.3 to 64.2 l/min (water, rising flow)    |
| Insertion version     | G 1/2" male thread for pipes DN 50 to DN 150                                |
| Body material         | Brass or stainless steel 1.4301                                             |
| Pressure rating       | 25 to 250 bar (≈360 to 3630 psi), depending on size and material            |
| Contact               | Normally open or normally closed, 230 V AC, 40 VA; 230 V DC, 40 W; max. 2 A |
| Electrical connection | 1.5 m two-core cable, IP65                                                  |

## Description

A paddle flow switch gives a switching signal when the flow of a liquid rises above or falls below a set value, for example as dry-running protection for pumps or to monitor cooling water. The flow deflects a paddle (impact disc). A lever moves a permanent magnet into the range of a reed contact that sits outside the medium, so the contact does not touch the liquid and needs no power supply.

When the flow stops, a leaf spring returns the paddle to its rest position. The switch point is adjustable within the range of each model, and the same contact unit works as a normally open or a normally closed contact. The switch points in this datasheet apply to water; with oils, coolants or other media the actual switch point shifts and must be checked in operation.

## Features

- ▶ Adjustable switch point within the range of each model
  - ▶ Normally open (factory setting) or normally closed operation, set by sliding the switch unit
  - ▶ Reed contact outside the medium, no supply voltage needed
  - ▶ Inline versions from G 1/4" to G 1 1/2" for 2.3 to 64.2 l/min (water)
- ▶ Insertion version for pipes from DN 50 to DN 150
  - ▶ Brass body with NBR seal, or stainless steel body with FKM seal for higher temperatures
  - ▶ Replaceable contact unit (see spare parts)

## Technical data

|                     |                                                                                                                                                                                                                                           |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Medium              | Low-viscosity liquids that do not attack the materials: water, water-based liquids, oils, coolants. With higher-viscosity media, the switch points can differ considerably from the stated values.                                        |
| Measuring principle | Paddle (impact disc) with magnet and reed contact                                                                                                                                                                                         |
| Switching range     | See models; values are approximate and apply to water                                                                                                                                                                                     |
| Hysteresis          | Difference between the switch point at rising and at falling flow; see models (for example 2.3 and 1.6 l/min: 0.7 l/min)                                                                                                                  |
| Pressure rating     | Brass: 100 bar (≈1450 psi) (G 1 1/4" and G 1 1/2": 25 bar (≈360 psi)); stainless steel: 250 bar (≈3630 psi) (G 1 1/4" and G 1 1/2": 40 bar (≈580 psi)); insertion version: brass 100 bar (≈1450 psi), stainless steel 250 bar (≈3630 psi) |
| Medium temperature  | Brass: -20 to +70 °C (≈-4 to 158 °F); stainless steel: -10 to +110 °C (≈14 to 230 °F)                                                                                                                                                     |
| Ambient temperature | -20 to +50 °C (≈-4 to 122 °F)                                                                                                                                                                                                             |
| Mounting position   | Any, with the switch housing perpendicular to the pipe axis; G 1 1/4" and G 1 1/2": horizontal pipes only                                                                                                                                 |
| Flow direction      | One direction only; the arrow on the fitting must point in the flow direction                                                                                                                                                             |
| Protection class    | IP65                                                                                                                                                                                                                                      |

## Electrical data

|                       |                                                                                                                             |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Contact               | Reed contact, normally open (factory setting) or normally closed, set by the position of the switch unit                    |
| Switching capacity    | 230 V AC, 40 VA; 230 V DC, 40 W; max. 2 A. All limits apply together: at 230 V the 40 VA or 40 W limit allows about 0.17 A  |
| Electrical connection | 1.5 m two-core cable (PVC)                                                                                                  |
| Insulation            | Contact sleeve of glass-fiber reinforced polyamide, protective insulation class II; no separate protective conductor needed |
| Power supply          | Not required (potential-free contact)                                                                                       |

## Materials

| Part                 | Brass version                     | Stainless steel version           |
|----------------------|-----------------------------------|-----------------------------------|
| Body                 | Brass                             | Stainless steel 1.4301            |
| Paddle (impact disc) | Stainless steel 1.4301            | Stainless steel 1.4301            |
| Leaf spring          | Stainless steel 1.4310            | Stainless steel 1.4310            |
| Lever                | Stainless steel 1.4310            | Stainless steel 1.4310            |
| Sleeve               | Brass                             | Stainless steel 1.4301            |
| Magnet               | Oxide ceramic                     | Oxide ceramic                     |
| Seal                 | NBR                               | FKM                               |
| Contact sleeve       | Polyamide, glass-fiber reinforced | Polyamide, glass-fiber reinforced |
| Cable                | PVC                               | PVC                               |

## Inline models

Switching ranges are approximate and apply to water. Rising flow: range of the switch-on point; falling flow: range of the switch-off point.

| Tameson SKU | Connection      | Body                   | Rising flow       | Falling flow     | Pressure | Medium temp.   | Weight |
|-------------|-----------------|------------------------|-------------------|------------------|----------|----------------|--------|
| M288C       | G 1/4" female   | Brass                  | 2.3 - 4.7 l/min   | 1.6 - 4.6 l/min  | 100 bar  | -20 to +70 °C  | 400 g  |
| M288D       | G 3/8" female   | Brass                  | 2.8 - 6 l/min     | 2.3 - 5.5 l/min  | 100 bar  | -20 to +70 °C  | 390 g  |
| M288E       | G 1/2" female   | Brass                  | 2.7 - 6.4 l/min   | 1.9 - 6.3 l/min  | 100 bar  | -20 to +70 °C  | 360 g  |
| M288F       | G 3/4" female   | Brass                  | 7.7 - 13.4 l/min  | 5.9 - 13 l/min   | 100 bar  | -20 to +70 °C  | 350 g  |
| M288G       | G 1" female     | Brass                  | 7.4 - 18.2 l/min  | 7.3 - 17.2 l/min | 100 bar  | -20 to +70 °C  | 440 g  |
| M288H       | G 1 1/4" female | Brass                  | 22 - 38.6 l/min   | 21 - 36 l/min    | 25 bar   | -20 to +70 °C  | 500 g  |
| M288J       | G 1 1/2" female | Brass                  | 34.8 - 64.2 l/min | 34 - 62.3 l/min  | 25 bar   | -20 to +70 °C  | 650 g  |
| M288K       | G 1/4" female   | Stainless steel 1.4301 | 2.3 - 4.7 l/min   | 1.6 - 4.6 l/min  | 250 bar  | -10 to +110 °C | 380 g  |
| M288M       | G 3/8" female   | Stainless steel 1.4301 | 2.8 - 6 l/min     | 2.3 - 5.5 l/min  | 250 bar  | -10 to +110 °C | 340 g  |
| M288N       | G 1/2" female   | Stainless steel 1.4301 | 2.5 - 6.4 l/min   | 1.9 - 6.3 l/min  | 250 bar  | -10 to +110 °C | 350 g  |
| M288P       | G 3/4" female   | Stainless steel 1.4301 | 7.7 - 13.4 l/min  | 5.9 - 13 l/min   | 250 bar  | -10 to +110 °C | 350 g  |
| M288Q       | G 1" female     | Stainless steel 1.4301 | 7.4 - 18.2 l/min  | 7.3 - 17.2 l/min | 250 bar  | -10 to +110 °C | 430 g  |
| M288R       | G 1 1/4" female | Stainless steel 1.4301 | 22 - 38.6 l/min   | 21 - 36 l/min    | 40 bar   | -10 to +110 °C | 480 g  |
| M288S       | G 1 1/2" female | Stainless steel 1.4301 | 34.8 - 64.2 l/min | 34 - 62.3 l/min  | 40 bar   | -10 to +110 °C | 600 g  |

## Insertion models

The insertion version screws into a G 1/2" socket, T-piece or reducer of the pipe. The switching range depends on the nominal pipe diameter (see next table).

| Tameson SKU | Connection  | Body                   | Pressure | Medium temp.   | Weight |
|-------------|-------------|------------------------|----------|----------------|--------|
| M2889       | G 1/2" male | Brass                  | 100 bar  | -20 to +70 °C  | 165 g  |
| M288A       | G 1/2" male | Stainless steel 1.4301 | 250 bar  | -10 to +110 °C | 160 g  |

## Insertion switching ranges

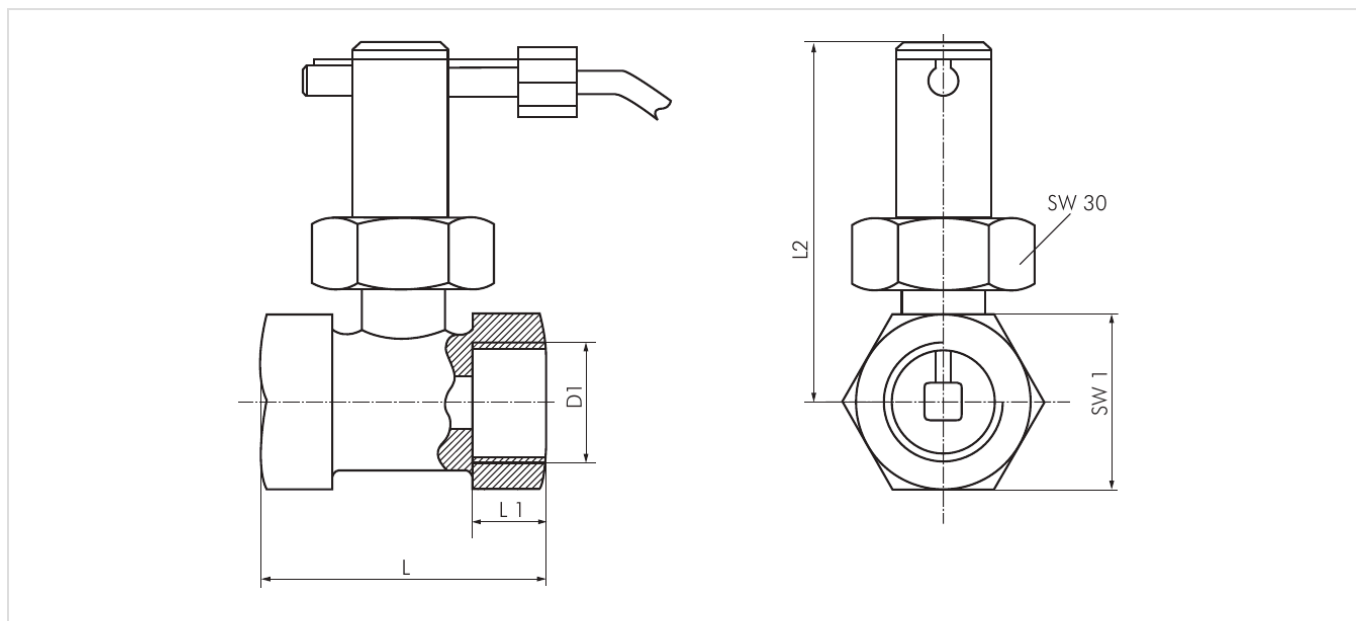
Approximate switching ranges for water when the insertion version is screwed into a pipe of the stated nominal diameter.



| Nominal pipe diameter | Rising flow     | Falling flow    |
|-----------------------|-----------------|-----------------|
| DN 50                 | 68 - 90 l/min   | 61 - 83 l/min   |
| DN 80                 | 183 - 250 l/min | 170 - 233 l/min |
| DN 100                | 320 - 400 l/min | 300 - 383 l/min |
| DN 150                | 700 - 917 l/min | 667 - 900 l/min |

## Inline dimensions

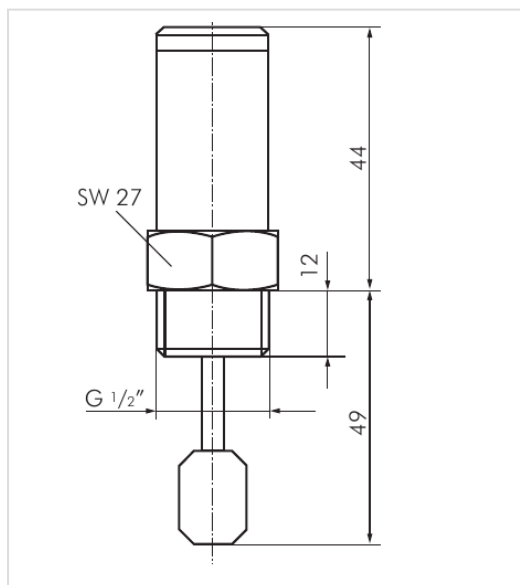
D1 = connection thread, L = overall length, L1 = thread depth, L2 = height from pipe axis, wrench size = body across flats. The union nut has wrench size 30. SW in the drawing = wrench size.



| Connection D1 | L (mm) | L1 (mm) | L2 (mm) | Wrench size (mm) |
|---------------|--------|---------|---------|------------------|
| G 1/4"        | 50     | 10      | 80      | 27               |
| G 3/8"        | 50     | 10      | 80      | 27               |
| G 1/2"        | 50     | 10      | 80      | 27               |
| G 3/4"        | 52     | 15      | 81.5    | 32               |
| G 1"          | 56     | 15      | 84      | 39               |
| G 1 1/4"      | 50     | 15      | 112     | 46               |
| G 1 1/2"      | 50     | 15      | 119     | 55               |

## Insertion dimensions

SW in the drawing = wrench size.



| Dimension                  | Value              |
|----------------------------|--------------------|
| Connection                 | G 1/2" male thread |
| Wrench size                | 27 mm              |
| Thread length              | 12 mm              |
| Height above thread        | 44 mm              |
| Paddle length below thread | 49 mm              |

## Installation

- 1 Check the application**  
Make sure the actual flow matches the switching range of the device and that the maximum pressure and temperature are not exceeded.
- 2 Remove transport protection**  
Remove all transport locks and packaging parts from the device.
- 3 Observe the mounting position**  
The paddle must stand upright and the switch housing perpendicular to the pipe axis. The arrow on the fitting must point in the flow direction. G 1 1/4" and G 1 1/2": horizontal pipes only.

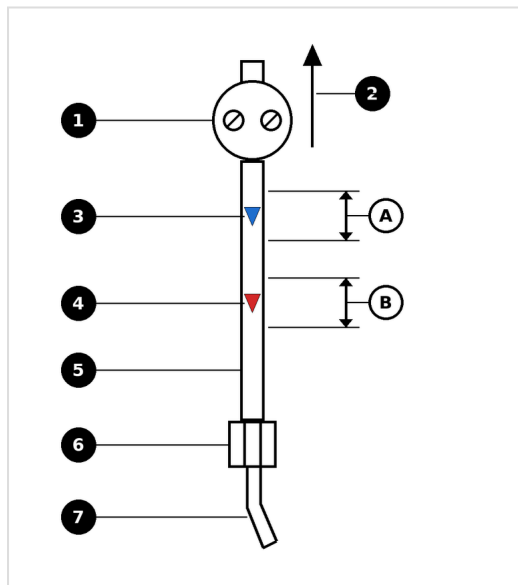
### Information

With dirty media, mount the switch housing as vertically as possible (max. 40° from vertical) so that dirt does not collect in the upper part; otherwise clean the device more often.

- 4 Seal the threads**  
Seal the connections with PTFE tape or a similar sealant.
- 5 Insertion version**  
Screw the G 1/2" male thread into the G 1/2" socket of a standard T-piece or reducer on a DN 50, 80, 100 or 150 pipe, with the paddle upright and the arrow in the flow direction. The switching range depends on the nominal diameter (see table).
- 6 Check for leaks**  
If possible, check the connection for leaks directly after mechanical installation.
- 7 Equipotential bonding**  
Include the all-metal device in the equipotential bonding of the system via the metal pipe.

## Switch unit parts

The switch unit slides along the upper part of the housing. The front edge of the locking disc is the reference mark for the setting.



| No. | Part                                                 |
|-----|------------------------------------------------------|
| 1   | Locking disc (upper part of the housing)             |
| 2   | Flow direction                                       |
| 3   | Blue or white arrow: setting aid for normally closed |
| 4   | Red arrow: setting aid for normally open             |
| 5   | Switch unit                                          |
| 6   | Strain relief                                        |
| 7   | Connection cable                                     |
| A   | Setting range normally closed                        |
| B   | Setting range normally open                          |

## Setting the switch point

Set the switch point by sliding the switch unit (5); the numbers refer to the drawing above.

1. Loosen the locking disc (1).
2. Normally open (factory setting): set the switch point in range B, at the red arrow (4). Normally closed: set it in range A, at the blue or white arrow (3).
3. Slide the switch unit in the flow direction (2) for the minimum switching values in the table, or against the flow direction for the maximum values.
4. Keep the lettering on the switch unit facing upwards, towards the locking disc, so the contact works correctly.
5. Tighten the locking disc again.

### Information

The table gives the end values of the setting range. For a switch point in between, adjust the switch unit with the actual flow running and check at which flow the contact switches.

## Contact behavior

Rising flow switches the contact at the set value; falling flow switches it back at the set value minus the hysteresis (see the rising and falling ranges in the model tables).

| Contact type                                 | No flow or flow below the set value | Flow at or above the set value |
|----------------------------------------------|-------------------------------------|--------------------------------|
| Normally open (factory setting, red arrow 4) | Open                                | Closed                         |
| Normally closed (blue or white arrow 3)      | Closed                              | Open                           |

## Electrical connection

Switch off the connected circuit before connecting. Connect the two wires of the 1.5 m cable to the switching circuit. The contact sleeve is protectively insulated (class II), so no separate protective conductor is needed.

### ⚠ Warning

The voltage and the current of the connected circuit must each stay within the rated values. Capacitive and inductive loads can weld the reed contacts and cause a dangerous malfunction; for such loads use a contact protection relay (not included), which also increases the switching capacity and life of the contact.

## Maintenance

With clean media the device is maintenance-free. Ferritic particles can collect on the magnet and larger dirt particles can jam the lever; a magnetic filter upstream prevents this. Check the device at intervals that suit the degree of contamination.

1. Switch off the power supply and make sure the pipe is empty, depressurized and without flow.
2. Inline version: open the union nut with an open-end wrench (wrench size 30) and take out the sleeve (upper part) and the paddle with its lever.
3. Clean the paddle without bending or twisting the leaf spring.
4. Check that the O-ring sits correctly in its groove; dirt on the O-ring causes leaks.
5. Put the lever back into the lower part of the housing and fit the sleeve, so that the pin of the paddle holder sits in the grooves of the lower part and the sleeve.
6. Tighten the union nut without twisting the upper part and check for leaks.

Reed contact unit (spare part)

The reed contact unit M288B is the switching part of every inline and insertion version of this series. It sits outside the medium, so a worn or damaged contact can be replaced without buying a complete new flow switch. The same unit works as a normally open or normally closed contact, depending on its position on the switch.

|                       |                                                                  |
|-----------------------|------------------------------------------------------------------|
| Tameson SKU           | M288B                                                            |
| Fits                  | All inline and insertion versions of this series                 |
| Contact type          | Reed contact, normally open (factory setting) or normally closed |
| Switching capacity    | 230 V AC, 40 VA; 230 V DC, 40 W; max. 2 A                        |
| Electrical connection | 1.5 m two-core cable, PVC                                        |
| Protection class      | IP65                                                             |
| Weight                | 75 g                                                             |

⚠ Warning

Only persons who know these instructions and the applicable safety rules may install, operate and service the device. Do not exceed the maximum pressure and temperature of the model. Depressurize and drain the line before removing the device or opening the union nut. Electrical work must be done by qualified personnel with the power switched off.

|                                                                                                                  |                                                                  |                                             |
|------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|---------------------------------------------|
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