

Operation Manual SRZ Helical Flow Meters



Küppers Elektromechanik

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1 General Information

1.1 At a Glance

The SRZ Helical flow meters are positive displacement meters with built-in hall sensors. They provide high resolution and reverse-flow detection.

The SRZ meters are perfect for media with high viscosity (30 to 10×10^6 mm²/s) featuring high accuracy and low pressure drop.

The measurement is pulsation free and insensitive to pulsating flows.

1.2 Safety

1.2.1 General Safety

All statements regarding safety of operation and technical data in this manual will only apply when the unit is operated correctly in accordance with this manual.

The data for Ingress Protection (IPxx) will only apply when all connectors are capped properly with the corresponding counterpart with the same or better IP rating. Cable glands must be populated with cables with the specified diameter and closed properly.

During operation all openings of the housing must be closed unless otherwise noted in this manual.

All connections to the load and to the supply must be made with shielded cables unless otherwise noted in this manual. This unit must be grounded.

This unit must be supplied by a safety approved power supply with outputs which comply with Safety Extra Low Voltage (SELV).

As a protection against fire in the positive supply a fuse with a current rating not higher than the current carrying capacity of the cable used is required.

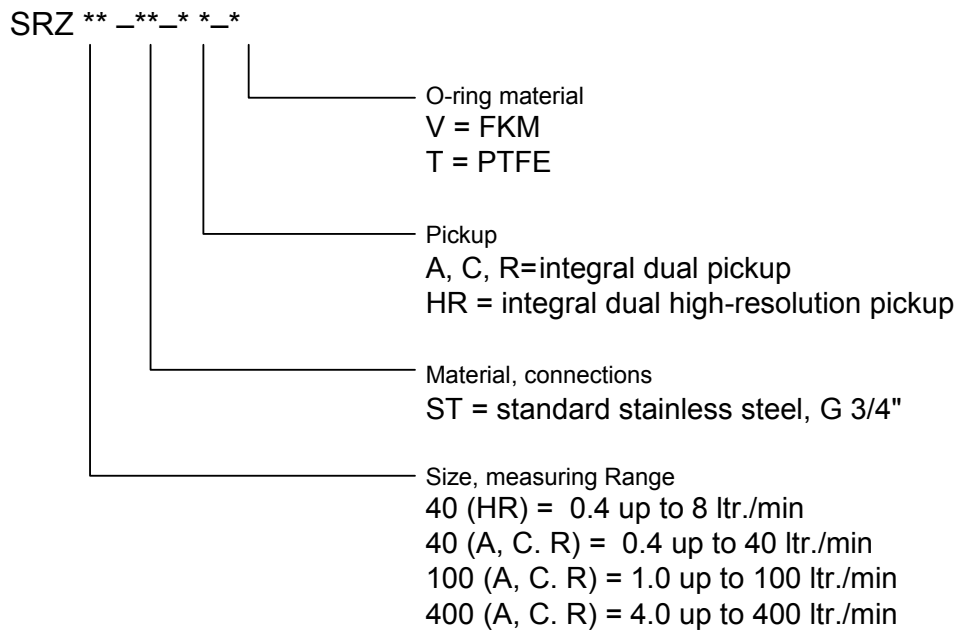
1.2.2 Special requirements for Ex installations

When used in hazardous area a suitable separation amplifier or zener barriers must be used.

When using long cables make sure that the maximum inductances and capacitances for the respective voltage or gas group are not exceeded.

1.3 Ordering Codes and Accessories

1.3.1 Ordering Code



1.3.2 Accessories

Ordering Code	Short description
	Connector M12; 5 pin, male; 713 cable, 5-core, black, 5 m with connector M12
EWS*	Intrinsically safe power supply and separation amplifier

2 Getting started

2.1 Unpacking

Verify that you have received the following items:

- SRZ Helical flow meter
- Operational Manual

2.2 Operating Elements



- 1 = electrical Connector
 2 = flow input
 3 = flow output

2.3 Pin Assignments

Type	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5
SRZ-A	+ UB	f_A	GND	2 * f	f_B
SRZ-C	+ UB		GND	2 * f	PE
SRZ-R	+ UB	Direction	GND	2 * f	n. c.
SRZ-HR	+ UB	f_B	GND	f_A	n. c.



+UB = 12 ... 30V DC
 SRZ-A is not available as Ex.

3 Installation

Note

All installations must be carried out by qualified service personnel.

3.1 Mechanical

Make sure the measuring range of the meter cannot be exceeded by more than 20%. Purge your

pipe system before installing the SRZ. Particles must not enter the SRZ as they could block the screw spindles. This is particularly important for the smallest size SRZ 10.

As a precaution the use of the following filters for the measuring medium is recommended:

SRZ 10: 120 micron

SRZ 40: 200 micron

SRZ 100 300 micron

SRZ 400 300 micron

3.1.1 Installing the SRZ

Mount the SRZ in a way that the main flow is in direction fo the arrow on the SRZ type plate. The SRZ works independent of the mechanical orientation. However, we recommend a vertical orientation with upwards going flow for low flow rates and low viscosities.

Connect the SRZ with the corresponding fittings (see chapter 6.4) and use the required sealants.

Note

Never use fibrous sealants such as hamp of PTFE strip for sealing.

3.2 Electrical

Make sure that the flow meter is grounded.

Note

The housing of the SRZ* is connected to the shield of the cable. In bigger systems a separate grounding of the meter might be required for avoiding high currents in the cable shield. In that case the shield might be left open or grounded via a capacitance of e. g. 100nF to avoid ground loops.

Note

Inproper grounding and shielding may lead to bad EMC behaviour or danger to your health!

Connect the SRZ* via a shielded cable to the control unit. The SRZ is specified for a supply voltage of 15 V or 24 V and will operate at supply voltages from 12 V up to 30 V.

Note

Make sure that all cable and wires are connected and fixed properly before applying power to the SRZ*!

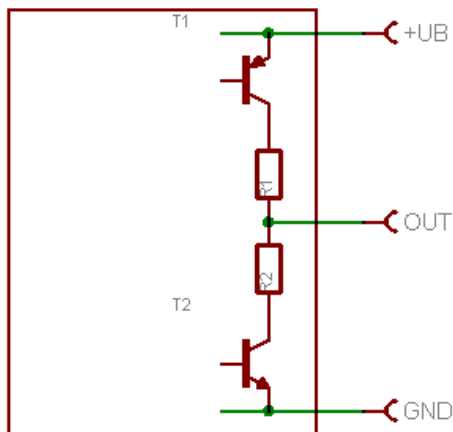


Figure 1: Output stage of the VTE*

The output driver for the frequency output is an asymmetrical push pull output stage with the protective resistors of $R1 = 720 \Omega$ and $R2 = 470 \Omega$ as shown in Note .

Note

The output can withstand a short circuit to ground for an infinite period whereas a short circuit to the positive supply for longer than a few seconds might destroy the output stage!

3.3 Ex installation

The SRZ*-Ex is intrinsically safe when operated with an EWS or zener barriers as described in the technical data (see chapter 6.3)

Mount the SRZ* as described in chapter 3.1.

Connect the SRZ to the intrinsically safe power supply type EWS or to suitable the zener barriers.

Note

When used in hazardous areas the SRZ* must not be connected to any circuitry except our intrinsically safe power supply type EWS or suitable zener barriers.

4 Operation

The SRZ* is ready to use and does not require any special settings. After applying the supply voltage the unit immediately provides an output signal proportional to the flow.

4.1 Evaluation

The K-factor is individually determined for each SRZ, this factor specifies the exact pulse rate per litre. The K-factor can be found in the *calibration record*, which is supplied with every SRZ. The calibration record contains specifications to adjust the evaluation equipment.

The actual flow is calculated as follows:

$$Q = \frac{f \cdot 60}{K}$$

with

- Q = flow rate in litres per minute
- f = output frequency in Hz
- K = K-factor of the SRZ in pulses per litre

5 Service and Maintenance

5.1 Maintenance

The SRZ* does not require regular maintenance.

For best performance, however, we recommend a recalibration every year if operated 24 hours a day or every 2 years if the unit is running less than 24 hours a day.

When used with aggressive or abrasive media the SRZ* should be checked and recalibrated even more often.

If there is no flow over a longer period, the SRZ* should be emptied and cleaned. This is especially important if curing media like paints are measured.

For recalibration and test, please contact your nearest dealer or directly KEM.
For the addresses see chapter 6.6

5.2 Trouble shooting

In case the VTE* does not work properly, first check the following items:

No output signal

All cables properly connected?

→ connect the missing cables

VTE* properly mounted?

→ Check mounting position and, if necessary, mount the VTE* properly

Output frequency too low

All cables properly connected?

→ reconnect the loose cables

Meter working properly?

→ Check and, if necessary, replace the meter

Output frequency too high or unstable

Most probably EMC problems

Shield and ground properly connected?

→ Connect shield properly. If necessary, try additional means of grounding and shielding

5.3 Service

The SRZ* does not contain any user serviceable parts.

In case of malfunction, please contact your nearest dealer or directly KEM.
For the addresses see chapter 6.6

6 Listings

6.1 Warranty

KEM warrants material and production for a period of 18 months after installation and start up, max. 24 months from delivery date.

6.2 Declaration of conformity

See separate sheet

6.3 Technical Data

6.3.1 General

Type size	Measuring Range ltr./min	K-Factor pulses/ltr.	Frequency Range in Hz
SRZ 40 HR	0,40 up to 8	33,000	20 up to 5,000
SRZ 40	0,40 up to 40	3,500	20 up to 1,740
SRZ 100	1,00 up to 100	850	8 up to 1,750
SRZ 400	4,00 up to 400	214	14 up to 1,800

Measuring media: fluids free of ferro-magnetic particles
 Linearity: $\pm 0.5\%$ of actual flow at 30 mm²/s or higher
 $\pm 0.25\%$ of actual flow at 100 mm²/s or higher
 Repeatability: $\pm 0.1\%$
 Operating temperature: -20 up to $+70^{\circ}\text{C}$
 Materials: SS 303 or SS316Ti/SS316L
 Ingress protection: IP67

Measuring ranges and accuracy are valid for viscosities of 30 mm²/s of higher. K-factors and frequencies are average values – individual values are included in calibration records.

6.3.2 Electrical Data

Nominal supply voltage: 15 VDC and 24 VDC
 Supply voltage range: 12 up to 30 VDC
 Supply current: typically < 20 mA at no load
 Output type: Push pull
 Max output current: > 10 mA max. (typically 20 mA)
 Output short circuit to GND: infinite
 to +UB < 1 s

6.3.3 Ex Supply Data

Supply circuit (pin 1 and 3)

Voltage $U_i = DC\ 30V$

Current $I_i = 120mA$

Power $P_i = 850mW$

effective internal capacitance $C_i = 8\ nF$

Signal current circuit push/pull (pin 4 and 3)

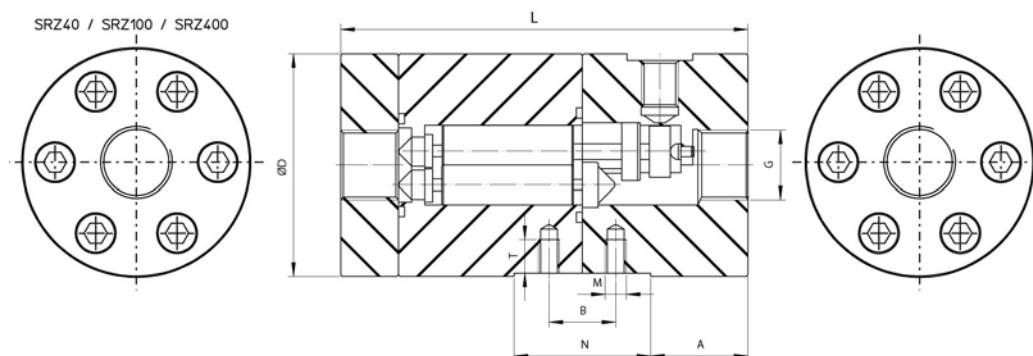
Voltage $U_i = 30\ V$

Current $I_i = 24.6\ mA$

Power $P_i = 185\ mW$

effective internal capacitance $C_i = 8\ nF$

6.4 Mechanical Drawings



Type	G	L	D	PN
SRZ 40	3/4"	155 mm	85 mm	400 bar
SRZ 100	1"	221 mm	110 mm	400 bar
SRZ 400	1 1/2"	318 mm	134 mm	400 bar

6.5 WEEE and RoHS

The unit described herein is not subject to the WEEE directive and the corresponding national laws.

At the end of life forward the unit to a specialised recycling company and do not dispose it of as domestic waste.

The unit described herein fully complies with the RoHS directive.

6.6 Address

Main office

KEM

Küppers Elektromechanik GmbH

Liebigstr. 2

DE-85757 Karlsfeld

Germany

Phone +49 81 31/59 39 10

info@kem-kueppers.com

www.kem-kueppers.com

Please see our website for worldwide contacts.

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