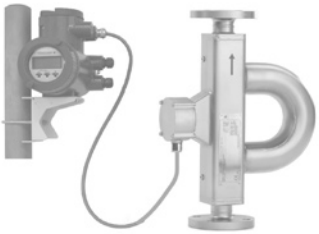
# General Specifications

## ROTAMASS 3 Series
## Coriolis Mass Flow and Density Meter

GS 01R4B04-00E-E

RCCT39/XR

RCCT34 - 39/IR



RCCF31 + RCCS34 - 39/IR

RCCS30 - 33

RCCR31



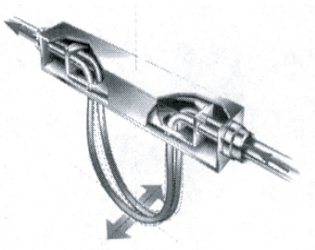
ROTAMASS is the integral and remote type Coriolis Mass Flowmeter. Both types have highly refined digital signal processing electronics, so that accurate and stable mass flow measurement is achieved.

ROTAMASS employs a flame-proof type converter case suitable for use in the hazardous area together with it's intrinsically safety type detector.

ROTAMASS´s signal processing, housing protection and its detector´s special decoupling system against external loads and vibrations, realize high performance in real applications.

## PRINCIPLE OF MEASUREMENT

Mass flow measurement according to the Coriolis principle. Almost all flowing materials including multi phase fluids, high viscosity liquids (pastes and slurries) and liquid with a certain content of gas. For difficult fluids (e.g. abrasive or highly corrosive fluids) and gases please contact your Yokogawa representative.



## FEATURES

- Field transmitter type mass flowmeter for nearly all fluids, including high viscosity liquids, slurries and multi phase media
- Field-mount and rack-mount remote converter available
- Refined digital signal processing enables accurate and stable measurement
- A special detector decoupling system makes the device highly independent from external loads or vibrations.
- Simple flow path means self-draining, food capable and simple to clean
- High accuracy and high stability over a wide range
- Accurate density measurement, up to +/- 0.0005 g(/0.03 lb/ft³)
- Concentration measurement for solutions, suspensions and emulsions (e.g. water cut, net oil computing)
- Two analog outputs, 2 pulse outputs or status-out and one status-in as standard I/O
- Available in explosion proof versions (ATEX, FM, IECEx, GOST/RTN, GOST K, INMETRO)
- European MID approval for Custody Transfer Measurement acc. OIML R-117-1 (see GS 01R04B07-00E-E)
- Wide temperature range –200°C to 350°C/ (-328°F to 662°F)
- Microprocessor-based multifunction capability
- EEPROM protects parameter settings and totalized values during power failure of any duration
- High visibly LCD display
- HART communication function
- Optional Foundation Fieldbus communication (see GS 01R04B05-00E-E)
- Optional intrinsically safe outputs
- Choice of tube materials
- EN, ASME or JIS flanges as standard, others on request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GS 01R04B04-00E-E



10th edition, January 2010 (Rü)

# PERFORMANCE SPECIFICATIONS

**Model**

- Remote detector RCCS30 to 33: 2 tubes, low flow design
- Remote detector RCCS34 to 39/XR : 2 tube design
- Remote field-mount converter RCCF31
- Remote rack-mount converter RCCR31
- Integral type RCCT34 to 39/XR: 2 tube integral design

**Fluid to be measured** : Liquid, gas or slurries

**Measurement items** : Mass flow, density, temperature and derived from these values: concentration, volume flow and net flow

**Mass flow measurement**

Table 1: measuring range

X= S-Remote / T=Integral

| Type | | RCCS30 | RCCS31 | RCCS32 | RCCS33 |
|---|---|---|---|---|---|
| Qmax | t/h | 0.1 | 0.3 | 0.6 | 1.5 |
| | lb/m | 3 | 11 | 22 | 55 |
| Qnom | t/h | 0.045 | 0.17 | 0.37 | 0.9 |
| | lb/m | 1 | 3 | 13 | 33 |

| Type | | RCCx34 | RCCx36 | RCCx38 | RCCx39 | RCCx39 /IR | RCCx39 /XR |
|---|---|---|---|---|---|---|---|
| Qmax | t/h | 5 | 17 | 50 | 170 | 300 | 600 |
| | lb/m | 183 | 624 | 1837 | 6246 | 11,023 | 22046 |
| Qnom | t/h | 2.7 | 10 | 32 | 100 | 250 | 500 |
| | lb/m | 99 | 367 | 1175 | 3674 | 9185 | 18,371 |

Qnom is the water flow rate at about 1 bar pressure drop. The flowmeter has an automatically low cut at 0.05% of Qnom.

Accuracy mass flow

Liquid : ± 0.1% of flow rate
± zero stability / flow rate *100% (refer to table 2)

Gas (option /GA) : ± 0.5% of flow rate
± zero stability / flow rate *100% (refer to table 2)

Accuracy volume flow **:**

SQRT ( (mass flow error in %)² + (density error in %)²)
Please refer to sizing.

Accuracy based on the frequency output includes the combined effects of repeatability, linearity and hysteresis.

Repeatability for liquids: ± 0.05%
± (zero stability/2) / flow rate *100%

Batch process : above specified accuracy if the batch process is >1 minute. For shorter batch time (dt in s) the accuracy decreases with the square root of 60/dt

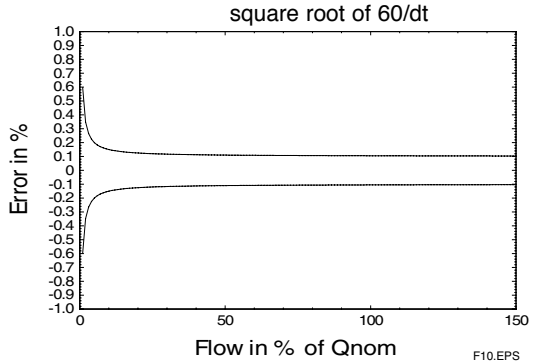



Table 2 : Zero Stability

X= S-Remote / T=Integral

| Type | RCCS30 | RCCS31 | RCCS32 | RCCS33 |
|---|---|---|---|---|
| kg/h | 0.005 | 0.0085 | 0.019 | 0.045 |
| lb/m | 0.09 | 0.31 | 0.70 | 1.65 |

| Type | RCCx34 | RCCx36 | RCCx38 | RCCx39 | RCCx39 /IR | RCCx39 /XR |
|---|---|---|---|---|---|---|
| kg/h | 0.135 | 0.5 | 1.6 | 5 | 13 | 25 |
| lb/m | 4.96 | 18.37 | 58.79 | 183.72 | 477.67 | 918.59 |

**Pressure dependency**

The stiffness of the ROTAMASS tubes is slightly line pressure dependent. The static pressure effect of mass flow and density can be corrected by setting the static pressure manually via menu.

Table 3 : Static pressure effect on mass flow (not corrected)

X= S-Remote / T=Integral

| Type | | RCCS30 | RCCS31 | RCCS32 | RCCS33 | RCCx34 |
|---|---|---|---|---|---|---|
| % of rate per bar (<14.5 PSI) | SS | | | | | 0.00081 |
| | | ---- | ---- | ---- | ---- | 0.01 |
| | HC | 0 | 0.00012 | 0.00246 | 0.02094 | 0.00084 |
| | | 0.00000 | 0.00000 | 0.04 | 0.30 | 0.01 |
| **Type** | | **RCCx36** | **RCCx38** | **RCCx39** | **RCCx39 /IR** | **RCCx39 /XR** |
| % of rate per bar (<14.5 PSI) | SS | -0.0033 | -0.0085 | -0.009 | -0.0456 | -.0074 |
| | | 0.05 | 0.14 | 0.15 | 0.42 | 0.11 |
| | HC | -0.0049 | -0.0126 | -0.0133 | -0.0675 | ---- |
| | | 0.05 | 0.13 | 0.13 | 0.26 | ---- |

**Density measurement**
Adjustment with water and air at calibration temperature.
With option /K4 thermal stabilized.
For option /K6 see also “Special calibrations” on page 3.
Measuring range: 0.3 kg /l to 5 kg/l (18.73 lb/ft³ to 31.2 lb/ ft³)
(RCCx39, 124 lb/ft³ RCCx39/IR and RCCx39/XR to 2 kg/l (124 lb/ft³))
No density measurement for gas application
Table 4: Accuracy (at calibration conditions):

$X = \frac{\text{S-Remote}}{\text{T=Integral}}$

| Type | Standard | Option /K4 | Option /K6 |
|---|---|---|---|
| RCCS30 | 0.008 g/cm³ | ------ | ------ |
| | 0.50 lb/ft³ | | |
| RCCS31 | 0.004 g/cm³ | 0.001 g/cm³ | ------ |
| | 0.25 lb/ft³ | 0.06 lb/ft³ | |
| RCCS32 | 0.004 g/cm³ | 0.001 g/cm³ | 0.0005 g/cm³ |
| | 0.25 lb/ft³ | 0.06 lb/ft³ | 0.03 lb/ft³ |
| RCCS33 | 0.004 g/cm³ | 0.001 g/cm³ | 0.0005 g/cm³ |
| | 0.25 lb/ft³ | 0.06 lb/ft³ | 0.03 lb/ft³ |
| RCCx34 | 0.003 g/cm³ | 0.001 g/cm³ | 0.0005 g/cm³ |
| | 0.019 lb/ft³ | 0.06 lb/ft³ | 0.03 lb/ft³ |
| RCCx36 | 0.0022 g/cm³ | 0.001 g/cm³ | 0.0005 g/cm³ |
| | 0.014 lb/ft³ | 0.06 lb/ft³ | 0.03 lb/ft³ |
| RCCx38 | 0.0015 g/cm³ | 0.001 g/cm³ | 0.0005 g/cm³ |
| | 0.09 lb/ft³ | 0.06 lb/ft³ | 0.03 lb/ft³ |
| RCCx39 | 0.0015 g/cm³ | 0.001 g/cm³ | 0.0005 g/cm³ |
| | 0.09 lb/ft³ | 0.06 lb/ft³ | 0.03 lb/ft³ |
| RCCx39/IR | 0.0015 g/cm³ | ------ | ------ |
| | 0.09 lb/ft³ | | |
| RCCx39/XR | 0.0015 g/cm³ | ------ | ------ |
| | 0.09 lb/ft³ | | |

Repeatability:
- RCCS32-33, RCCx34-39/XR : ± 0.0005 g/cm³ (0.01 lb/ft³) (0.03 lb/ft³) (Std, /K4)
- RCCS32-33, RCCx34-39 : ± 0.0002 g/cm³ (0.01 lb/ft³) (/K6)

Static pressure effect:
Compensated if static pressure is set in the menu
Installation:
Vertical, else correction term must be set in the software
Specification of high performance density measurement (option /K6):
Ambient temp. range : -10ºC(14ºF) to 50ºC(122ºF)
Fluid temp. range : -50ºC (-58ºF) to 150ºC (302ºF)
Minimum flow rate for specified accuracy:
- RCCx36 to RCCx39 : 700 kg/h (1543.24 lb/h)
- RCCx34 : 140 kg/h (308.65 lb/h)
- RCCS33 : 90 kg/h (198.42 lb/h)
- RCCS32 : 37 kg/h (81.57 lb/h)

Maximum flow rate : Qnom
Repeatability : ± 0.0002 g/cm³ (0.01 lb/h)
Temperature measurement: ±0.5ºC ±0.2% of reading
Density accuracy : ±0.0005 g/cm³ (0.03 lb/ft3) (no gas in the liquid)
Process temperature influence:
0.000015 g/cm³* abs(Tfluid -20ºC (-4Fº)

**Temperature measurement**
Temperature measuring range of converter :
Standard, L/T, M/T : -200°C to 230°C (328˚F to 446˚F)
Option /HT : 0°C to 350°C (32˚F to 662˚F)
Accuracy:
Standard
-70ºC to 230ºC (-94ºF to 446ºF): ±(0.5ºC (33ºF) +0.005*abs($T^{medium}$ -20°C (-4˚F))
Option /MT
-70ºC to 230ºC (-94ºF to 446ºF): ±(0.5ºC (33ºF)+0.005*abs($T^{medium}$-20°C (-4˚F))
Option /LT
-200ºC to 150ºC (-328ºF to 302ºF): ±(1.0ºC (39ºF)+0.008*abs($T^{medium}$-20°C (-4˚F))
Option /HT
0ºC to 350ºC) (32ºF to 662ºF): ±(1.0ºC (39ºF) +0.008*abs($T^{medium}$-20°C (-4˚F))
For process temperatures more than 176°F higher/lower than ambient temperature the detector should be insulated to maintain optimum accuracy.

**Heat Tracing**
Heating with heat carrier, insulation and protection housing.
The max. surface temperature at the protection housing from inner heating is 104°F. Above 302°F process temperature insulation from the manufacturer is recommended. However
up to 446°F process temperature the customer can insulate the detector themselves.
Option /T1 : only insulation and protection
Option /T2 : insulation, protection and heating line
Option /T3 : like /T2 but with ventilation
Process connection for the heat carrier fluid (see table 10):
for D-type flanges : EN DN 15 PN 40 Form B1
for A-type flanges : ANSI ½ - 150 lbs.
for J-type flanges : JIS DN15 10K
Max. pressure : PN 40
Protection class : IP54, install roof protected
For fluid temperatures below -94°F select option /LT and ask for special insulation (see also page 10).

**Calibration for liquids and gases :**
The ROTAMASS flow meters are always factory calibrated with water.
Calibration Conditions:
- Water : 22.5ºC (72.5ºF) ± 12.5ºC (55ºF)
- Ambient temperature : 22.5ºC (72.5ºF) ± 12.5ºC (55ºF)
- Process Pressure : 1 to 2 bar abs / 14.5 to 29 PSI A

For gas applications please choose option /GA.
All specifications are based on above mentioned calibration reference conditions, a flow calibration protocol is attached to each instrument.

**Special calibrations**
- Mass-/Volume flow calibration with factory certificate (option /K2):
  Calibration with water at customer specified flow values according calibration order sheet.
- Mass-/Volume flow calibration with DKD certificate (EN17025: 2005) (option /K5):
  Calibration with water at customer specified flow values according calibration order sheet.
- Density calibration with factory certificate (option /K6) (not with /GA):
  Adjustment and check with 3 different fluids, fluid temperature influence adjustment for low ambient temperature influence and thermal treatment for long term density measurement stability, enhanced temperature measurement (see also page 11).

**Dual Seal approval (option /DS):**
- Conform with ANSI/ISA-12.27.01.
- Only for use with hazardous substances.
- Up to ANSI class 900 line pressure.
- Only with FM approval option.
- For liquid application the leakage detection is realized by software in the converter.
- For gas application options /GA and /RD (rupture disk) are mandatory.
- Rupture disk is only for annunciation.

# NORMAL OPERATING CONDITIONS

**Ambient temperature limits**

- Remote detector RCCS3 :
  - Standard : -50ºC to +80ºC (-58ºF to176ºF)
  - Option /LT : -50ºC to +80ºC (-58ºF to176ºF)
  - Option /MT : -50ºC to +80ºC (-58ºF to176ºF)
  - Option /HT : -50ºC to +65ºC (-58ºF to149ºF) (up to 280ºC (536ºF) (medium temperature) -50ºC to +55ºC (-58ºF to131ºF) (up to 652ºF medium temperature)

terminal box lower 100ºC (212ºF)

- Remote converter RCCF31, RCCR31 and Integral type RCCT3:
  - Display work. range : -20ºC to +55ºC (-4ºF to 131ºF)
  - Electronic work. range : -40ºC to +55ºC (40ºF to 131ºF)
  - Cold start : above -30ºC (-22ºF)

Where meters are mounted in direct sunlight, it is recommended to install a sunshade. This is particularly important in countries with high ambient temperatures.

**Ambient humidity limits** : 0 to 95% R.H.

**Process temperature limits**

Detector :

- RCCS30 to 33 : -50ºC to 150ºC (58ºF to 302ºF)
- RCCS34 to 39/XR : -70ºC to 150ºC (90ºF to 302ºF)
- RCCS34 to 39/XR /MT : -100ºC to 230ºC (90ºF to 446ºF) (Range 150ºC – 230ºC (302ºF to 446ºF) recommended with /Tx option)
- RCCS34 to 39/XR /LT : -200ºC to 150ºC (-328ºF to 302ºF)
- RCCS34 to 39/IR /HT : 0ºC to 350ºC / (32ºF to 662ºF) (only with /Tx option)
- On request : -200ºC to 150ºC (-328ºF to 302ºF)

Integral type :

- RCCT34 to 39/XR : -50ºC to 150ºC (-58ºF to 302ºF)

**Heat carrier fluid temperature limits**

(option /T2 or /T3 only for remote type RCCS30 to 39/IR)

- Standard : 0ºC to 150ºC (32ºF to 302ºF)
- With option /LT : -200ºC to 150ºC (-328ºF to 302ºF)
- With option /MT : 0ºC to 230ºC (32ºF to 446ºF)
- With option /HT : 0ºC to 350ºC (32ºF to 662ºF)

For fluid temperatures below -70ºC (-94ºF) select option /LT and ask for special insulation (see also page 10).

**Process pressure limits**

According to the flange ratings:

- EN PN 16 : max 16 bar (232 psi)
- EN PN 40 : max 40 bar (580 psi)
- EN PN 63 : max 63 bar (913 psi)
- EN PN 100 : max 100 bar (1450 psi)
- ASME class 150 : max 16 bar (232 psi)
- ASME class 300 : max 41 bar (594 psi)
- ASME class 600 : max 83 bar (1203 psi)
- ASME class 900 : max 124 bar (1798 psi)
- ASME class 1500 : max 207 bar (3002 psi)
- JIS 10K : max. 14 bar (203 psi)
- JIS 20K : max. 34 bar (493 psi)

The RCCS30 to RCCS34 also have thread connection. For these connections the max. allowed tube pressure is the limitation.For all other standard process connections please find the max. process pressure in table 9.

Maximum tube pressure for SL/SH up to 27ºC (180ºF) (RT=Room Temp.):

- RCCS30 / 31 / 32 : 285 bar (4133 psi)
- RCCS33 : 185 bar (2683 psi)
- RCCS34 / RCCT34 : 260 bar (3770 psi)
- RCCS36 / RCCT36 : 210 bar (3045 psi)
- RCCS38 / RCCT38 : 175 bar (2538 psi)
- RCCS39 / RCCT39 : 135 bar (1958 psi)
- RCCS39/IR / RCCT39/IR : 110 bar (1596 psi)
- RCCS39/XR / RCCT39/XR : 95 bar (1377 psi)

For higher medium temperatures maximum tube pressure needs to be derated as follows :

- up to 50 ºC (122ºF) : 4% derating
- 51 to 100 ºC (123º to 212ºF) : 11% derating
- 101 to 150 ºC (213º to 302ºF) : 20% derating
- 151 to 230 ºC (303º to 446ºF) : 30% derating
- 231 to 350 ºC (447º to 662ºF) : 38% derating

Higher pressure on request.

The maximum process pressure of a single instrument is given by the lower value either of the process connections (table 9) or tubes. The maximum temperature and process pressure limits of an instrument are marked on the nameplate as TS and PS.

**Gas content limits for liquid/gas mixtures**

Gas content limit is defined as the amount of gas in a liquid/gas mixture which generates an error (frequency error) in the converter. The gas content limit is dependent on viscosity, surface tension and bubble size of the liquid/gas mixture. Furthermore it is highly flow rate dependent (the higher the flow rate, the lower the gas content limits). The stated values are for a flow of 50% of Qnom and water/air without /HP:

- RCCS32 to 33 : no limitation
- RCCx34 : no limitation
- RCCx36 : approx. 50%
- RCCx38 : approx. 30%
- RCCx39 : approx. 7%
- RCCx39/IR : approx. 3%
- RCCx39/XR (with /HP) : approx. 2%

With option /HP the gas content limits are improved.

With liquid/gas mixtures the specified mass flow accuracy will not be achieved.

For short time aeration a function can be activated to keep the current outputs constant during the aeration time.

**Secondary containment**

The housings of the RCCS30-33 and the RCCx39/XR are not rated for secondary containment. Rupture pressure for RCCS/T34-38 is typical above 120bar (1740 psi), for RCCS/T39 above 80 bar (1160 psi), for RCCS/T39IR above 50 bar (725 psi). However if the detector housing is exposed to this pressure it will deform and measurement will be strongly influenced. Therefore the pressure test of the housing (option /J1) can only be done at the pressure where deformation does not happen.

**2 phase flow, liquid/solid and liquid/liquid**

2 phase flow can generate minus span errors. The errors are proportional to the difference in density between the 2 phases and the amount of the second phase. If the particles (or droplets) are very small no errors will be generated.

**Power supply and power consumption**

- AC-type : 90 to 264 V AC, 47-63 Hz
  For Ex version 250 V AC max.
- DC-type : 20.5 to 28.8 V DC

Consumption : max. 25 VA / 10 W

# MECHANICAL SPECIFICATIONS

**Protection class**
- RCCT3x : IP66/67
- RCCF31 : IP66/67
- RCCS3x : IP66/67
- RCCS/Tx : IP54
- RCCR31 : IP20

**Materials**
- Detector housing : Stainless steel 304/1.4301
- Detector terminal box : 316L/1.4404
- Detector gas filling plug: 1.4305
- Detector rupture disk (/RD) : 316L
- Field- mount converter housing : Aluminium alloy with Polyurethane corrosion-resistant coating or epoxy coating (option /X1)
- Rack- mount converter housing : Aluminium

**Coating colour**
- Field-mount converter case : Mint green

**Wetted parts**
- RCCS30 to 33 :
  Tubes : Hastelloy C-22/2.4602
  Process connections : 316L / 1.4404
- RCCx34 to 39/IR :
  Tubes and process connection : 316L / 1.4404/1.4435 or Hastelloy C-22/2.4602
- RCCx39/XR :
  Tubes and process connection : 316L / 1.4404

Table 5 : Diameter of measuring tubes

$X = \frac{\text{S-Remote}}{\text{T=Integral}}$

| Type | | RCCS30 | RCCS31 | RCCS32 | RCCS33 |
|---|---|---|---|---|---|
| Inner diameter | mm | 1.2 | 2.1 | 3 | 4.5 |
| | inch | 0.05 | 0.08 | 0.12 | 0.18 |
| Wall thickness | mm | 0.25 | 0.25 | 0.25 | 0.25 |
| | inch | 0.01 | 0.01 | 0.01 | 0.01 |

| Type | | RCCx34 | RCCx36 | RCCx38 | RCCx39 | RCCx39 /IR | RCCx39 /XR |
|---|---|---|---|---|---|---|---|
| Inner diameter | mm | 7.6 | 13.4 | 22.1 | 37.2 | 55.1 | 82.50 |
| | inch | 0.30 | 0.53 | 0.87 | 1.46 | 2.17 | 3.25 |
| Wall thickness | mm | 0.91 | 1.24 | 1.65 | 2.6 | 2.9 | 3.2 |
| | inch | 0.04 | 0.05 | 0.06 | 0.10 | 0.10 | 0.13 |

**Pressure Equipment Directive 97/23/EC**
- Module : H; Fluid group : 1; Category : III

RCCx34-RCCx38 : Fluid group 2, SEP
RCCx39-RCCx39/XR : Fluid group 2, Cat. I

**For all process connections** : CRN 0F12074.5

# ELECTRICAL SPECIFICATIONS

**Power supply**
- AC- type : 90 V to 264 V
  90 V to 250 V for Ex-type
- DC- type : 20.5 V to 28.8 V

External circuit breaker rating : 5 A, 250 V (In the converter no power switch is installed).

**Fuse on Base Board** :
- AC- type : 2 A, T, breaking capacity 1500A
- DC- type : 2 A, T, breaking capacity 1500A

**I/O signals**
- Two active current outputs:
  4 to 20 mA DC, galvanic separated from other signals,
  Load resistance : 20 Ω to 600 Ω
  Failure current according NAMUR NE43
  Ambient temperature effect : < 0.05% of span/10°C
  Linearity : 0.008 mA = 0.05% of span
  Setting range URV for liquids: 5 to 100% of Qnom
  Setting range URV for gases: 1 to 100% of Qnom
- Two Pulse outputs / status outputs :
  Passive Transistor contact output, 30 V DC, 200 mA
  Output rate :
  Output 1 : 0 to 10000 pulses/s
  Output 2 : 0 to 2000 pulses/s
  Option /NM : passive, according EN 60947-5-6
  Option /AP : active output, 12 V, 6 mA, $R_L$ > 10 kΩ
  Active pulse output is not isolated from current output 2
  As frequency output :
  Output 1 : 20 Hz to 10000 Hz
  Output 2 : 20 Hz to 2000 Hz
- Status input : Voltage-free contact
  Closed : < 200 Ω
  Open : > 100 kΩ

**Intrinsic safe outputs (/KF2), a total of 2 outputs**
- One passive current output (additional power supply needed) :
  4 to 20 mA DC, galvanic separated from other signals.
  Supply voltage 10.5 V to 30 V DC (without HART), 165 mA
  Supply voltage 16.75 V to 30 V DC (with HART), 165 mA
  Load resistance : 20 Ω ... 600 Ω
  Ambient temperature effect : < 0.05% of span/10°C
- One pulse output / status output :
  Passive Transistor contact output, 30 V DC, 100 mA
  Output rate : 0 to 2000 pulses/s
  As frequency output : 20 Hz to 2000 Hz
  Option /NM : passive, according EN 60947-5-6

**Digital communication**
- HART communication signal, superimposed on 4 -20 mA DC signal (Iout1)
- Load resistance : 230Ω to 600 Ω (including cable)
- Power line spacing : >15 cm, avoid parallel wiring
- Cable length : ≤ 2 km if „CEV" cables are used
- Foundation Fieldbus communication (/FB)
- see GS 01R04B05-00E

**Setting functions**
Parameter setting is possible by using the switches on the display or with HART communication.

**Display function**
- Up to 4 lines.
- 3 languages selectable (English, German, French)
- Instantaneous flow rate, density, temperature or totalized flow can be displayed.

**Damping functions**
Settable from 0.1 seconds (63% response time) to 200 seconds, controls display and outputs.

**Isolation resistance of converter**
When surge arrestors are removed
- between power and ground terminal : 100 MΩ / 500 V DC
- between power and I/O terminals : 20 MΩ / 100 V DC
- between I/O terminals and ground : 20 MΩ / 100 V DC

**Dielectric strength**
When surge arrestors are removed
- between power and ground terminal : 1,500 V AC for 1 minute

**Lightning Protection**
Arresters (2000A) are inside converter for power supply lines.

**EMC**
Acc. EN 61326-1: 2006; EN 61326-2-3: 2006

## REMOTE CABLE RCCY03 SPECIFICATION

Li2Y(St)/CY 3x2 AWG24 + 1x3 AWG20 or Li2Y(St)/CY 6x2 AWG24
pair/triple shielded; pair/triple twisted; overall shielding
RCCY033/034 and RCCY031/032/KS1: flame propagation acc. IEC 60332-1.
Table 6 : Cable specifications

| Model code | Temperature range | Wire gauge | Resistance of loop | Capacitance wire/wire | Capacitance wire/shield | Inductance wire/wire |
|---|---|---|---|---|---|---|
| **RCCY031/032** | -50 to +70°C | AWG 24 | 190 Ω/km | 157 nF/km | 249 nF/km | 0.60 mH/km |
| | -58º to 158ºF | AWG 20 | 70 Ω/km | 193 nF/km | 290 nF/km | 0.65 mH/km |
| **RCCY031/032 /KS1** | -50 to +70°C | AWG 24 | 190 Ω/km | 157 nF/km | 249 nF/km | 0.60 mH/km |
| | -58º to 158ºF | AWG 20 | 70 Ω/km | 193 nF/km | 290 nF/km | 0.65 mH/km |
| **RCCY033/034** | -30 to +105°C | AWG 24 | 177 Ω/km | 175 nF/km | 350 nF/km | 0.80 mH/km |
| | -22º to 221ºF | AWG 20 | 70 Ω/km | 145 nF/km | 290 nF/km | 0.70 mH/km |
| **RCCY033/034 /KS1** | -30 to +105°C | AWG 24 | 180 Ω/km | 190 nF/km | 118 nF/km | 0.60 mH/km |
| | -22º to 221ºF | | | | | |

**Digital communication**
- HART communication signal, superimposed on 4 -20 mA DC signal (Iout1)
  - Load resistance : 230 Ω to 600 Ω (including cable)
  - Power line spacing : >15 cm, avoid parallel wiring
  - Cable length : ≤ 2 km if „CEV" cables are used
- Foundation Fieldbus communication (/FB)
  - see GS 01R04B05-00E

**Setting functions**
Parameter setting is possible by using the switches on the display or with HART communication.

**Display function**
- Up to 4 lines.
- 3 languages selectable (English, German, French)
- Instantaneous flow rate, density, temperature or totalized flow can be displayed.

**Damping functions**
Adjustable from 0.1 seconds (63% response time) to 200 seconds, controls display and outputs.

**Isolation resistance of converter**
When surge arrestors are removed
- between power and ground terminal: 100 MΩ / 500 V DC
- between power and I/O terminals : 20 MΩ / 100 V DC
- between I/O terminals and ground : 20 MΩ / 100 V DC

**Dielectric strength**
When surge arrestors are removed
- between power and ground terminal : 1,500 V AC for 1 minute

**Lightning Protection**
Arresters (2000 A) are inside converter for power supply lines.

**EMC**
Acc. EN 61326-1: 2006
EN 61326-2-3: 2006
EN 61000-3-2: 2006
EN 61000-3-3: 1995+A1+A2

## HAZARDOUS AREA SPECIFICATIONS

**ATEX**

**Remote detector RCCS30 ... 39/XR (option /KS1):**
- KEMA 01ATEX 1075 X
- Intrinsically safe
- II 2G Ex ib IIB/IIC T1 ... T6
- II 2D Ex ibD 21 IP6x Txxx (xxx = max. surface temperature see below)
- Max. surface temperature :
  - Standard : 150ºC (302ºF)
  - /MT : 220ºC (428ºF)
  - /HT : 350ºC (662ºF)
- Degree of protection : IP67
- Ambient humidity : 0 to 95% RH
- Ambient temperature range
  - Standard and option /MT : –50ºC to +80ºC (-58º to 176ºF)
  - Option /HT (process temperature < 280ºC (536ºF) : –50ºC to +65ºC (-58º to 149ºF)
  - Option /HT (process temperature < 350ºC (662ºF) : –50ºC to +55ºC (-58º to 131ºF)
- Process temperature limits :
  - Standard : -50ºC to 150ºC (-58º to 302ºF)
  - Option /MT: : -50ºC to 220ºC (-58º to 428ºF)
  - Option /HT : 0ºC to 350ºC (32º to 662ºF)
- Heat carrier fluid temperature limits
  - Standard : -50ºC to 150ºC (-58º to 302ºF)
  - Option /MT: : -50ºC to 220ºC (-58º to 428ºF)
  - Option /HT : 0ºC to 350ºC (32º to 662ºF)

**Remote converter RCCF31 (option /KF1) :**
- KEMA 02ATEX 2183 X
- Flame proof with intrinsic safe connection to detector (ib)
- II 2G Ex d(e) [ib] IIC T6
- II 2G Ex d(e) [ib] IIB T6 with option /HP
- II 2D Ex tD [ibD] A21 IP6x T70°C (158˚F)
- Max. surface temperature : 70°C (158˚F)
- Degree of protection : IP67
- Power supply : 90 to 250 V AC, 50/60 Hz or 20.5 to 28.8 V DC
- Power consumption : max. 25 VA / 10 W
- Ambient humidity : 0 to 95% RH
- Ambient temperature range : -20ºC to +50ºC (-4ºF to 122ºF)

**Remote converter RCCF31 (option /KF2) :**
- KEMA 02ATEX 2183 X
- Flame proof with intrinsic safe connection to detector (ib)
- Additional intrinsic safe outputs.
- II 2G Ex d(e) [ia] [ib] IIC T6
- II 2G Ex d(e) [ia] [ib] IIB T6 with option /HP
  Protection [ia] refers to the intrinsic safe outputs.
  Protection [ib] refers to the connection to the detector.
- II 2D Ex tD [ibD] A21 IP6x T70°C (158ºF)
- Max. surface temperature : 70°C (158ºF)
- Degree of protection : IP67
- Power supply : 90 to 250 V AC, 50/60 Hz or 20.5 to 28.8 V DC
- Power consumption : max. 25VA / 10W
- Ambient humidity : 0 to 95% RH
- Ambient temperature range : -20ºC to +50ºC (-4ºF to 122ºF)

**Remote converter RCCR31 (option /KS1) :**
- KEMA 02ATEX 2183 X
- Associated apparatus with intrinsic safe connection to detector (ib)
- II (2)G [Ex ib] IIC
- II (2)G [Ex ib] IIB with option /HP
- II (2)D [Ex ibD]
- Power supply : 90 to 250 V AC, 50/60 Hz or 20.5 to 28.8 V DC
- Power consumption : max. 25 VA / 10 W
- Ambient humidity : 0 to 95% RH
- Ambient temperature range : -20ºC to +50ºC (-4ºF to 122ºF)

**WARNING**

Remote rack-mount converter RCCR31 must be installed in safe area !

**Integral type RCCT34 ... 39/XR (option /KF1) :**
- KEMA 02ATEX 2183 X
- Flame proof with intrinsic safe connection to detector (ib)
- II 2G Ex d(e) [ib] IIC T6 ... T3
- II 2G Ex d(e) [ib] IIB T6 ... T3 with option /HP
- II 2D Ex tD A21 IP6x T150°C (302˚F)
- Max. surface temperature : 150°C (302˚F)
- Degree of protection : IP67
- Power supply : 90 to 250V AC, 50/60 Hz or 20.5 to 28.8 V DC
- Power consumption : max. 25V A / 10 W
- Ambient humidity : 0 to 95% RH
- Ambient temperature range : -20ºC to +50ºC (-4ºF to -122ºF)

**Integral type RCCT34 ... 39/XR (option /KF2) :**
- KEMA 02ATEX 2183 X
- Flame proof with intrinsic safe connection to detector (ib)
- Additional intrinsic safe outputs.
- II 2G Ex d(e) [ia] [ib] IIC T6 ... T3
- II 2G Ex d(e) [ia] [ib] IIB T6 ... T3 with option /HP
  Protection [ia] refers to the intrinsic safe outputs.
  Protection [ib] refers to the connection to the detector.
- II 2D Ex tD A21 IP6x T150°C (304˚F)
- Max. surface temperature : 150°C (304˚F)
- Degree of protection : IP67
- Power supply : 90 to 250V AC, 50/60 Hz or 20.5 to 28.8V DC
- Power consumption : max. 25 VA / 10 W
- Ambient humidity : 0 to 95% RH
- Ambient temperature range : -20ºC to +50ºC (-4ºF to -122ºF)

**Electrical data Remote detector RCCS30 ... 33 :**
- Driving circuit : terminals D+ and D
  Ex ib IIC : Ui = 16 V; Ii = 53 mA; Pi = 0.212 W
  Li = 4.2 mH; Ci = negligible small
  Ex ib IIB : Ui = 16 V; Ii = 153 mA; Pi = 0.612 W
  Li = 4.2 mH; Ci = negligible small
- Sensor circuits: terminals S1+ and S1- or S2+ and S2-
  Ex ib IIC : Ui = 16 V; Ii = 80 mA; Pi = 0.32 W
  Li = 4.2 mH; Ci = negligible small
- Temperature sensor circuit : terminals TP1, TP2, TP3
  Ex ib IIC : Ui = 16 V; Ii = 50 mA; Pi = 0.2 W
  Li = negligible small; Ci = negligible small

**Electrical data Remote detector RCCS34 ... 39/XR** :
- Driving circuit : terminals D+ and D
  Ex ib IIC : Ui = 16 V; Ii = 53 mA; Pi = 0.212 W
  Li = 3.2 mH; Ci = negligible small
  Ex ib IIB : Ui = 16 V; Ii = 153 mA; Pi = 0.612 W
  Li = 3.2 mH; Ci = negligible small
- Sensor circuits: terminals S1+ and S1- or S2+ and S2-
  Ex ib IIC : Ui = 16 V; Ii = 80 mA; Pi = 0.32 W
  Li = 2.1 mH; Ci = negligible small
- Temperature sensor circuit : terminals TP1, TP2, TP3
  Ex ib IIC : Ui = 16 V; Ii = 50 mA; Pi = 0.2 W
  Li = negligible small; Ci = negligible small

**Electrical data Remote converter RCCF31, RCCR31 and converter of Intergral type RCCT3** :
- Driving circuit : terminals D+ / D-
  Ex [ib] IIC : Uo = 14.5 V; Io = 47 mA; Po = 0.171 W
  Lo = 15 mH; Co = 0.65 $\mu$F
  Ex [ib] IIB : Uo = 11.7 V; Io = 124 mA; Po = 0.363 W
  Lo = 8 mH; Co = 10.3 $\mu$F
- Sensor circuits: terminals S1+/ S1- or S2+ / S2-
  Ex [ib] IIB/IIC : Uo = 14.5 V; Io = 47 mA; Po = 0.171 W
  Ex [ib] IIC : Lo = 15 mH; Co = 0.65 $\mu$F
  Ex [ib] IIB : Lo = 60 mH; Co = 4.07 $\mu$F
- Temperature sensor circuit : terminals TP1, TP2, TP3
  Ex [ib] IIB/IIC : Uo = 13.3 V; Io = 40 mA; Po = 0.133 W
  Ex [ib] IIC : Lo = 20 mH; Co = 0.91 $\mu$F
  Ex [ib] IIB : Lo = 80 mH; Co = 5.6 $\mu$F
- Current output (only option /KF2) :
  Ex [ia] IIC : Ui = 30 V; Ii = 165 mA; Pi = 1.25 W
  Li = negligible small; Ci = 6.9 nF
- Pulse output (only option /KF2) :
  Ex [ia] IIC : Ui = 30 V; Ii = 100 mA; Pi = 0.75 W
  Li = negligible small; Ci = 4.5 nF

Temperature classification see table 7.

## INMETRO APPROVAL (For Brazil)

RCCS3x with option /US1.
RCCT3x with options /UF1 ... /UF2 same as ATEX /KF1 ... /KF2
RCCF31 with options /UF1 ... /UF2 same as ATEX /KF1 ... /KF2
RCCR31 with option /US1 same as ATEX /KS1
Same parameters and specifications as ATEX approval.

## FM (For USA and Canada)

**Remote detector RCCS30 ... 39/XR (option /FS1) :**
- Intrinsically safe
- AEx ia IIC, Class 1, Zone 0
- IS Class I, Division 1, Groups A, B, C, D T6
- DIP Class II / III, Division 1, Groups E, F, G
- IP67 / NEMA 4X
- Ambient temperature range : -50ºC to +80ºC (-58ºF to 176ºF)

**Remote converter RCCF31 (option /FF1) :**
- Housing explosion proof
- Provides intrinsically safe detector circuits
- AEx d [ia] IIC, Class I, Zone 1, T6
- AEx d [ia] IIB, Class I, Zone 1, T6 with option /HP
- Class I, Division 1, Groups A,B,C,D
- Class I, Division 1, Groups C,D with option /HP
- Class II / III, Division 1, Groups E,F,G
- AIS Class I / II / III, Division 1, Groups A,B,C,D,E,F,G
- AIS Class I / II / III, Division 1, Groups C,D,E,F,G with /HP
- IP67 / NEMA 4X
- Ambient temperature range : -40ºC to +50ºC
  (-58ºF to 176ºF)

**Remote converter RCCR31 (option /FS1) :**
- Intrinsic safe associated apparatus
- Provides intrinsically safe detector circuits
- [AEx ia] IIC, Class I, Zone 1
- [AEx ia] IIB, Class I, Zone 1, T6 with option /HP
- AIS Class I, Division 1, Groups A,B,C,D
- AIS Class I, Division 1, Groups C,D with option /HP
- Ambient temperature range : -40ºC to +50ºC
  (-40ºF to +122ºF)

**Integral type RCCT34 ... 39/XR (option /FF1) :**
- Housing explosion proof
- AEx d [ia] IIC, Class I, Zone 1, T6
- AEx d [ia] IIB, Class I, Zone 1, T6 with option /HP
- Class I, Division 1, Groups A,B,C,D
- Class I, Division 1, Groups C,D with option /HP
- Class II / III, Division 1, Groups E,F,G
- IP67 / NEMA 4X
- Ambient temperature range : -40ºC to +50ºC
  (-40ºF to +122ºF)

**Process temperature limits :**
- Standard : -50°C to 150°C (-58°F to 302°F)
- with option /MT : -50°C to 220°C (-58°F to 428°F)
- with option /HT : 0°C to 350°C (32°F to 662°F)

**Heat carrier fluid temperature limits :**
- Standard : -50°C to 150°C (-58°F to 302°F)
- with option /MT : -50°C to 220°C (-58°F to 428°F)
- with option /HT : 0°C to 350°C (32°F to 662°F)

**Electrical data Remote converter RCCF31, RCCR31 and converter of Intergral type RCCT3 :**
- Driving circuit : terminals D+ / D-
  Uo = 14.5 V; Io = 47 mA; Po = 0.171 W
  Lo = 15 mH; Co = 0.65 $\mu$F
- Driving circuit : terminals D+ / D- with option /HP
  Uo = 11.7 V; Io = 124 mA; Po = 0.363 W
  Lo = 8 mH; Co = 10.3 $\mu$F
- Sensor circuits: terminals S1+/ S1- or S2+ / S2-
  Uo = 14.5 V; Io = 47 mA; Po = 0.363 W
  Lo = 15 mH; Co = 0.65 $\mu$F
- Temperature sensor circuit : terminals TP1, TP2, TP3
  Uo = 13.3 V; Io = 40 mA; Po = 0.133 W
  Lo = 20 mH; Co = 0.91 $\mu$F

**Electrical data Remote detector RCCS30 ... 33 :**
- Driving circuit : terminals D+ and D
  Groups A-D: Ui = 16 V; Ii = 53 mA; Pi = 0.212 W
  Li = 4.2 mH; Ci = negligible small
  Groups C,D: Ui = 16 V; Ii = 153 mA; Pi = 0.612 W
  Li = 4.2 mH; Ci = negligible small
- Sensor circuits: terminals S1+ and S1- or S2+ and S2-
  Ui = 16 V; Ii = 80 mA; Pi = 0.32 W
  Li = 4.2 mH;Ci = negligible small
- Temperature sensor circuit : terminals TP1, TP2, TP3
  Ui = 16 V; Ii = 50 mA; Pi = 0.2 W
  Li = negligible small; Ci = negligible small

**Electrical data Remote detector RCCS34 ... 39/XR :**
- Driving circuit : terminals D+ and D
  Groups A-D: Ui = 16 V; Ii = 53 mA; Pi = 0.212 W
  Li = 3.2mH; Ci = negligible small
  Groups C,D: Ui = 16 V; Ii = 153 mA; Pi = 0.612 W
  Li = 3.2mH; Ci = negligible small
- Sensor circuits: terminals S1+ and S1- or S2+ and S2-
  Ui = 16 V; Ii = 80 mA; Pi = 0.32 W
  Li = 2.1 mH;Ci = negligible small
- Temperature sensor circuit : terminals TP1, TP2, TP3
  Ui = 16 V; Ii = 50 mA; Pi = 0.2 W
  Li = negligible small; Ci = negligible small

The remote converter RCCF31 has a T6 temperature class rating for operation at ambient temperature up to +50°C (+122°F).

Special conditions :
- ROTAMASS with FM approval is only available with ANSI 1/2" NPT cable conduit connection "A".
- The flowmeter must be connected to the potential equalization system.
- For AC-version maximum power supply is 250V AC.
- For remote type the maximum cable length is 50m (164ft).
- For remote type at ambient temperature up to 50°C (122°F) use remote cable RCCY031 or RCCY032.
- For remote type at ambient temperature from 50°C (122°F) up to 80°C (176°F) use remote cable RCCY033 or RCCY034.
- Use conduit seals within 18 inches for power supply- and IO- cable entries at RCCT3 / RCCF31.

Temperature classification see table 7.

## GOST APPROVAL

Rota Yokogawa has the "Pattern Approval Certificate of Measuring Instruments" which allows to export the instrument to Russia, Kazakhstan, Uzbekistan and other CIS countries. Furthermore ROTAMASS is RTN (GGTN) approved for installation in hazardous areas. For the export of ROTAMASS to CIS countries please contact your Yokogawa representative.

## IECEx APPROVAL

Certificate: IECEx KEM 06.00

Remote detector RCCS30 ... 39/XR (option /ES1):
- Intrinsically safe
- II 2G Ex ib IIB/IIC T6
- Standard : Ex ibD 21 IP6x T150ºC (302ºF)
  Option /MT : Ex ibD 21 IP6x T220ºC (468ºF)
  Option /HT : Ex ibD 21 IP6x T350ºC (662ºF)
- Max. surface temperature :
  Standard : 150ºC (302ºF)
  /MT : 220ºC (468ºF)
  /HT : 350ºC (662ºF)
- Degree of protection : IP67
- Ambient humidity : 0 to 95% RH
- Ambient temperature range
  Standard and option /MT
  : –50ºC to +80ºC (-58ºF to 176ºF)

Option /HT (process temperature < 280ºC (536ºF)
: –50ºC to +65ºC (-58ºF to 149ºF)

Option /HT (process temperature < 350ºC (662ºF)
: –50ºC to +55ºC (-58ºF to 131ºF)
- Process temperature limits :
  Standard : -50ºC to 150ºC (-58ºF to 302ºF)
  Option /MT: : -50ºC to 220ºC (-58ºF to 428ºF)
  Option /HT : 0ºC to 350ºC (32ºF to 662ºF)
- Heat carrier fluid temperature limits :
  Standard : -50ºC to 150ºC (-58ºF to 302ºF)
  Option /MT: : -50ºC to 220ºC (-58ºF to 428ºF)
  Option /HT : 0ºC to 350ºC (32ºF to 662ºF)

**Remote converter RCCF31 (option /EF1) :**
- Explosion proof with intrinsic safe connection to detector (ib)
- II 2G Ex d(e) [ib] IIC T6
- II 2G Ex d(e) [ib] IIB T6 with option /HP
- II 2D Ex tD [ibD] A21 IP6x T70ºC (158ºF)
- Max. surface temperature : 70ºC (158ºF)
- Degree of protection : IP67
- Power supply : 90 to 250V AC, 50/60 Hz or
  20.5 to 28.8V DC
- Power consumption : max. 25VA / 10W
- Ambient humidity : 0 to 95% RH
- Ambient temperature range : -20ºC to +50ºC (-4ºF to 122ºF)

**Remote converter RCCF31 (option /EF2) :**
- KEMA 02ATEX 2183 X
- Explosion proof with intrinsic safe connection to detector (ib)
- Additional intrinsic safe outputs.
- II 2G Ex d(e) [ia] [ib] IIC T6
- II 2G Ex d(e) [ia] [ib] IIB T6 with option /HP
  Protection [ia] refers to the intrinsic safe outputs.
  Protection [ib] refers to the connection to the detector.
- II 2D Ex tD [ibD] A21 IP6x T70ºC (158ºF)
- Max. surface temperature : 70ºC (158ºF)
- Degree of protection : IP67
- Power supply : 90 to 250V AC, 50/60 Hz or
  20.5 to 28.8V DC
- Power consumption : max. 25VA / 10W
- Ambient humidity : 0 to 95% RH
- Ambient temperature range : -20ºC to +50ºC (-4ºF to 122ºF)

**Remote converter RCCR31 (option /ES1) :**
- Associated apparatus with intrinsic safe connection to detector (ib)
- II (2)G [Ex ib] IIC
- II (2)G [Ex ib] IIB with option /HP
- II (2)D [Ex ibD]
- Power supply : 90 to 250 V AC, 50/60 Hz or
  20.5 to 28.8 V DC
- Power consumption : max. 25 VA / 10 W
- Ambient humidity : 0 to 95% RH
- Ambient temperature range :-20ºC to +50ºC (-4ºF to 122ºF)

**WARNING**

Remote rack-mount converter RCCR31 must be installed in safe area !

**Integral type RCCT34 ... 39/XR (option /EF1) :**
- Explosion proof with intrinsic safe connection to detector (ib)
- II 2G Ex d(e) [ib] IIC T6 ... T3
- II 2G Ex d(e) [ib] IIB T6 ... T3 with option /HP
- II 2D Ex tD A21 IP6x T150°C (302˚F)
- Max. surface temperature : 150°C (302˚F)
- Degree of protection : IP67
- Power supply : 90 to 250 V AC, 50/60 Hz or
  20.5 to 28.8 V DC
- Power consumption : max. 25 VA / 10 W
- Ambient humidity : 0 to 95% RH
- Ambient temperature range : --20ºC to +50ºC (-4ºF to 122ºF)

**Integral type RCCT34 ... 39/XR (option /EF2) :**
- Flame proof with intrinsic safe connection to detector (ib)
- Additional intrinsic safe outputs.
- II 2G Ex d(e) [ia] [ib] IIC T6 ... T3
- II 2G Ex d(e) [ia] [ib] IIB T6 ... T3 with option /HP
  Protection [ia] refers to the intrinsic safe outputs.
  Protection [ib] refers to the connection to the detector.
- II 2D Ex tD A21 IP6x T150°C (302˚F)
- Max. surface temperature : 150°C (302˚F)
- Degree of protection : IP67
- Power supply : 90 to 250 V AC, 50/60 Hz or
  20.5 to 28.8 V DC
- Power consumption : max. 25 VA / 10 W
- Ambient humidity : 0 to 95% RH
- Ambient temperature range : -20ºC to +50ºC (-4ºF to 122ºF)

**Electrical data Remote converter RCCF31, RCCR31 and converter of Intergral type RCCT3 :**
- Driving circuit : terminals D+ / D-
  Ex [ib] IIC : Uo = 14.5 V; Io = 47 mA; Po = 0.171 W
  Lo = 15 mH; Co = 0.65 $\mu$F
  Ex [ib] IIB : Uo = 11.7 V; Io = 124 mA; Po = 0.363 W
  Lo = 8 mH; Co = 10.3 $\mu$F
- Sensor circuits: terminals S1+/ S1- or S2+ / S2-
  Ex [ib] IIB/IIC : Uo = 14.5 V; Io = 47 mA; Po = 0.171 W
  Ex [ib] IIC : Lo = 15 mH; Co = 0.65 $\mu$F
  Ex [ib] IIB : Lo = 60 mH; Co = 4.07 $\mu$F
- Temperature sensor circuit : terminals TP1, TP2, TP3
  Ex [ib] IIB/IIC : Uo = 13.3 V; Io = 40 mA; Po = 0.133 W
  Ex [ib] IIC : Lo = 20 mH; Co = 0.91 $\mu$F
  Ex [ib] IIB : Lo = 80 mH; Co = 5.6 $\mu$F
- Current output (only option /EF2) :
  Ex [ia] IIC : Ui = 30 V; Ii = 165 mA; Pi = 1.25 W
  Li = negligible small; Ci = 6.9 nF
- Pulse output (only option /EF2) :
  Ex [ia] IIC : Ui = 30 V; Ii = 100 mA; Pi = 0.75 W
  Li = negligible small; Ci = 4.5 nF

**Electrical data Remote detector RCCS30 ... 33:**

- Driving circuit : terminals D+ / D-
  Ex ib IIC : Ui = 16 V; Ii = 53 mA; Pi = 0.212 W
  Li = 4.2 mH; Ci = negligible small
  Ex ib IIB : Ui = 16 V; Ii = 153 mA; Pi = 0.612 W
  Li = 4.2 mH; Ci = negligible small
- Sensor circuits: terminals S1+/ S1- or S2+ / S2-
  Ex ib IIC : Ui = 16 V; Ii = 80 mA; Pi = 0.32 W
  Li = 4.2 mH; Ci = negligible small
- Temperature sensor circuit : terminals TP1, TP2, TP3
  Ex ib IIC : Ui = 16 V; Ii = 50 mA; Pi = 0.2 W
  Li = negligible small;
  Ci = negligible small

**Electrical data Remote detector RCCS34 ... 39/XR:**

- Driving circuit : terminals D+ / D
  Ex ib IIC : Ui = 16 V; Ii = 53 mA; Pi = 0.212 W
  Li = 3.2 mH; Ci = negligible small
  Ex ib IIB : Ui = 16 V; Ii = 153 mA; Pi = 0.612 W
  Li = 3.2 mH; Ci = negligible small
- Sensor circuits: terminals S1+/ S1- or S2+ / S2-
  Ex ib IIC : Ui = 16 V; Ii = 80 mA; Pi = 0.32 W
  Li = 2.1 mH; Ci = negligible small
- Temperature sensor circuit : terminals TP1, TP2, TP3
  Ex ib IIC : Ui = 16 V; Ii = 50 mA; Pi = 0.2 W
  Li = negligible small;
  Ci = negligible small

Temperature classification see table 7.

## PRESSURE LOSS

Pressure loss depends on velocity, viscosity and density of the fluid. For newtonian fluids the pressure loss is shown in table 8 (1 kg/l, 1 mPas).

Table 8: Pressure loss

| Type | | RCCS30 | RCCS31 | RCCS32 | RCCS33 |
|---|---|---|---|---|---|
| Qmax | bar | 4.45 | 2.72 | 2.34 | 2.50 |
| | psi | 64.54 | 39.45 | 33.94 | 36.26 |
| Qnom | bar | 1.11 | 0.97 | 1.00 | 1.01 |
| | psi | 16.10 | 14.07 | 14.50 | 14.65 |

| Type | | RCCx34 | RCCx36 | RCCx38 | RCCx39 | RCCx39 /IR | RCCx39 /XR |
|---|---|---|---|---|---|---|---|
| Qmax | bar | 2.50 | 3.01 | 3.58 | 2.35 | 1.40 | 1.42 |
| | psi | 36.26 | 43.66 | 51.92 | 34.08 | 20.31 | 20.60 |
| Qnom | bar | 0.98 | 0.95 | 0.97 | 0.98 | 1.00 | 1.04 |
| | psi | 14.21 | 13.78 | 14.07 | 14.21 | 14.50 | 15.08 |

NOTE :

- For correct pressure loss determination please use the Yokogawa sizing program.
- The pressure losses are valid for constant flows. Pulsating flow causes a considerably higher pressure loss on average.

Table 7 : Temperature classification for ATEX, FM, IECEx and INMETRO certified flowmeter

| | **RCCS30 to RCCS33 without insulation** | | **RCCS30 to RCCS33 with factory insulation** | |
|---|---|---|---|---|
| Temp. class | Max. ambient temperature | Max. process temperature | Max. ambient temperature | Max. process temperature |
| T6 | 50°C (122°F) | 60°C (140°F) | 60°C (140°F) | 60°C (140°F) |
| T5 | 50°C (122°F) | 80°C (176°F) | 80°C (176°F) | 90°C (194°F) |
| T4 | 80°C (176°F)<br>50°C (122°F) | 100°C (212°F)<br>120°C (248°F) | 80°C (176°F) | 130°C (266°F) |
| T3 | 80°C (176°F) | 150°C (302°F) | 80°C (176°F) | 150°C (302°F) |
| T2 | 80°C (176°F) | 150°C( 302°F) | 80°C (176°F) | 150°C (302°F) |

| | **RCCS34 to RCCS39/XR without insulation** | | **RCCS34 to RCCS39/XR with factory insulation** | | **RCCT34 to RCCT39/XR** | |
|---|---|---|---|---|---|---|
| Temp. class | Max. ambient temperature | Max. process temperature | Max. ambient temperature | Max. process temperature | Max. ambient temperature | Max. process temperature |
| T6 | 40°C (104°F) | 40°C (104°F) | 65°C (149°F) | 65°C (149°F) | 50°C (122°F) | 65°C (149°F) |
| T5 | 55°C (131°F) | 55°C (131°F) | 75°C (167°F) | 75°C (167°F) | 50°C (122°F) | 80°C (176°F) |
| T4 | 80°C (176°F)<br>40°C (104°F) | 100°C (212°F)<br>120°C (248°F) | 70°C (158°F) | 115°C (239°F) | 50°C (122°F) | 115°C (239°F) |
| T3 | 80°C (176°F)<br>40°C (104°F) | 160°C (320°F)<br>180°C (356°F) | 70°C (158°F) | 180°C (356°F) | 50°C (122°F) | 150°C (302°F) |
| T2 | 80°C (176°F) | 220°C (428°F) | 65°C (149°F) | 275°C (527°F) | | |
| T1 | | | 45°C (113°F) | 350°C (662°F) | | |

# PLANNING AND INSTALLATION HINTS

**Design Limits**
It is the responsibility of the user to use the instrument within the given design limits. Erosion and corrosion influence the accuracy and may restrict the temperature / pressure limits. Therefore corrosion and erosion should be avoided.

**Installation**
The flowmeter can be installed vertically, horizontally or in any other position, as long as the measuring tubes are completely filled with the measured liquid during measurement.

**Redundant installation**
If two flowmeters of the same size are installed in series mutual interference called cross talk may take place. Cross talk occurs due to the fact that both meters have the same resonance frequency. If serial installation is planned please contact your Yokogawa representative who can ensure that a frequency adjustment is made to one of the meters at the factory.

**Sizing**
The measuring range and accuracy are virtually independent of fluid conditions and size of the connecting pipe. Select a suitable nominal size from pressure loss calculation. Check whether the measuring range and accuracy at minimal flow fit the application. The calculations of the pressure loss are based on Newtonian fluids. For correct calculation of the pressure drop use the ROTAMASS Sizing software DUREP V which is part of the Yokogawa Flow Configurator.

**Sanitary Applications**
For sanitary applications select process connection S2, S4 or S8. The wetted surface will be Ra ≤ 1.6$\mu$m (63$\mu$in). However, if option /SFx is selected the surface roughness will be Ra < 0.8$\mu$m (32$\mu$in) and with /SF2 a certificate with a 3- point roughness measurement is delivered. The EHEDG certificate shows that ROTAMASS conforms to the EHEDG criteria regarding the capability to be cleaned by a CIP process. The evaluation does not include the process connections and seals.

**Cavitation**
To avoid cavitation keep the back pressure of the fluid sufficiently above the vapor pressure of the fluid. For low viscous fluids following condition should be fulfilled at the given temperature:

$p_{back} > p_{vapor} + 0.7*\Delta p$

With $\Delta p$ = pressure loss (e.g. given by the sizing program)

**Long Term Stability**
To get stable deflection of the tubes by the coriolis forces the stiffness and therefore the wall thickness has to kept constant during measuring. With corrosion or erosion the meter factor is drifting with time and recalibration is necessary. Select the suitable resistant tube material for the process!

**Recalibration Service**
Yokogawa offers via its European flow centre (Rota Yokogawa, Germany) full recalibration service, if necessary with a certificate traceable to German national standards. Please contact your Yokogawa affiliate or directly Rota Yokogawa, Germany.

**Heat tracing and insulation**
Basically the detector can be insulated by the customer. The converter should not be exceeded more than 50ºC (122ºF). Therefore never insulate the converter and keep the neck free from insulation too. To be sure not to overheat the connection box choose one of /Tx options (insulation or heat tracing from Yokogawa). For temperatures between 150ºC (302ºF) and 230ºC (446ºF) choose /MT option and remote installation. For low temperature fluids ask for special insulation.

**Installation above 100ºC (212ºF) process temperature**
To provide enough cooling the instrument should be installed vertically or horizontally with the converter down. This is recommended for size RCCT/S36 and larger without /Tx option.

**Installation below 0ºC (32ºF) process temperature**
The detector can be insulated to prevent ice capping either by the customer or by the manufacturer. Ask your Yokogawa representative for special insulation. If the customer wants to insulate by themselves a closed cell foam as insulation material is recommended to avoid water siphon. In this case option /S2 should be selected. For temperatures below -70°C (-94˚F) option /LT is recommended (on request).

**Zero adjustment function**
Zero point can be adjusted either by setting the switches on display or with the HART communication or with status input when the fluid is stopped and the detector filled. To ensure no flow conditions isolation valves should be installed. To achieve the specified accuracy a zero should be performed at process conditions (temp., pressure).

**Pressure / Temperature dependencies of process connections**
See also process pressure limits in chapter ”Normal operation conditions”.

**Concentration measurement for liquids**
The Standard Concentration Measurement (option /CST) is suitable for concentration measurement of emulsions or suspensions, where the density of the solid is assumed to be fix. It can also be used for (mainly low concentration) solutions if the two fluids are not strongly interacting. The density change of the liquid components due to temperature can normally be described with a linear or quadratic function with very high accuracy within the desired measurement range. The coefficients of these function (linear and quadratic thermal expansion coefficients) must be either known or have to be determined prior to using this function.
For interacting liquids the Advanced Concentration Measurement options should be used, these options can be ordered using the appropriate /Cxx concentration measurement option. For more information please see TI 01R04B04-04E-E “Concentration Measurement with ROTAMASS”.

**Rupture disk**
The rupture disk is used as annunciation method in the case of tube rupture preferable for high pressure gas service. Practically a tube rupture of ROTAMASS is not known to the manufacturer. For large sizes it cannot be expected that the full line pressure can be released via the rupture disk. If this is requested please contact Yokogawa for a special execution.

**Density measurement**
We offer 3 levels of density measurement. The standard adjustment (also /K4) delivers an accuracy up to 0.001 g/cm³(0.06 lb/ft³), if the fluid density is around 1 kg/l. However, at elevated temperatures the density error may increase. For option /K4 the instrument is preheated ensuring long term stability. However, if high density stability is needed at high temperatures option /HT is recommended. Option /K6 includes preheating, a full calibration at 3 different densities, increased temperature measurement specification and individual adjustment of the fluid temperature dependency. For more information please see TI 01R04B04-05E ”Density Measurement with ROTAMASS”.

| Option | Accuracy | Certificate | Description | Application |
|---|---|---|---|---|
| Standard | ± 0.0015 g/cm³ to ± 0.008 g/cm³<br>±0.09lb/ft³ to 0.50lb/ft3 | Standard (mass flow) factory calibration certificate | - Standard adjustment with water and air<br>- Density constants given in mass flow certificate | - Process medium and environment are approximately at room temperature, the density range is 0.9 kg/l to 1.1 kg/l (0.008lb/gal to 0.009lb/gal) |
| Option /K4 | ± 0.001 g/cm³<br>±0.06lb/ft³ | Standard (mass flow) factory calibration certificate | - Thermal treatment of the sensor and special hardware design<br>- Standard adjustment with water and air<br>- Density constants given in mass flow certificate | - Improved volume flow accuracy<br>- Process medium up to 150°C (302˚F), for higher temperature select option /HT<br>- Density range is 0.9 kg/l to 1.1 kg/l (0.008lb/gal to 0.009lb/gal) |
| Option /K6 | ± 0.0005 g/cm³<br>±0.031lb/ft³ | Separate factory density calibration certificate | - Thermal treatment of the sensor and special hardware design<br>- Density calibration with 3 different liquids<br>- Individual adjustment of the fluid temperature dependency | - Density and concentration measurement in addition to the mass flow:<br>- Process medium up to 150°C (302˚F), for higher temperature select option /HT<br>- Density range 0.3 kg/l to 2 kg/l (0.002lb/gal to 0.017lb/gal)<br>- Best volume flow accuracy |

**Explosion proof concept and option /HP**
The detector is intrinsically safe, the converter flame (explosion) proof (RCCF31) or intrinsically safe associated apparatus (RCCR31). The driving power from converter to detector is limited and protected by a barrier, which is part of the converter. The barrier is protecting the detector either for gas group IIC or IIB (option /HP). With option /HP the detector driving power is higher which is benefit to 2 phase flow. This is also true for non hazardous applications. Option /KF2 delivers one passive intrinsic safe current and one pulse output, however the converter is flame (explosion) proof.

| Type of process connection [1] | | Process Temperature | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | RT[2] | 50ºC | 100ºC | 150ºC | 200ºC | 250ºC | 300ºC | 350ºC |
| A1 | Flange acc. ASME B16.5 Class 150 | 15.9 bar | 15.3 bar | 13.2 bar | 12.0 bar | 11.0 bar | 10.2 bar | 9.7 bar | 8.4 bar |
| | | 230 psi | 222 psi | 191 psi | 174 psi | 159 psi | 148 psi | 141 psi | 122 psi |
| A2 | Flange acc. ASME B16.5 Class 300 | 41.4 bar | 40.0 bar | 34.5 bar | 31.2 bar | 28.7 bar | 26.7 bar | 25.2 bar | 24.0 bar |
| | | 600 psi | 580 psi | 500 psi | 453 psi | 416 psi | 387 psi | 366 psi | 348 psi |
| A3 | Flange acc. ASME B16.5 Class 600 | 82.7 bar | 80.0 bar | 69.9 bar | 62.8 bar | 58.3 bar | 54.9 bar | 52.1 bar | 50.1 bar |
| | | 1199 psi | 1160 psi | 1014 psi | 910 psi | 845 psi | 796 psi | 754 psi | 725 psi |
| A4 | Flange acc. ASME B16.5 Class 900 | 124.1 bar | 120.0 bar | 104.4 bar | 94.2 bar | 87.5 bar | 82.4 bar | 78.2 bar | 75.2 bar |
| | | 1798 psi | 1740 psi | 1508 psi | 1363 psi | 1261 psi | 1189 psi | 1131 psi | 1087 psi |
| A5 | Flange acc. ASME B16.5 Class 1500 | 206.8 bar | 200.1 bar | 173.9 bar | 157.0 bar | 145.8 | 137.3 | 130.3 bar | 125.4 bar |
| | | 2987 psi | 2900 psi | 2509 psi | 2277 psi | 2103 psi | 1987 psi | 1885 psi | 1812 psi |
| D2 | Flange acc. EN 1092-1 PN Class 16 | 16 bar | 15.6 bar | 14.2 bar | 12.8 bar | 11.7 bar | 10.9 psi | 10.3 bar | 9.9 bar |
| | | 232 psi | 226 psi | 205 psi | 185 psi | 169 psi | 158 psi | 149 psi | 143 psi |
| D4 | Flange acc. EN 1092-1 PN Class 40 | 40 bar | 39.1 bar | 35.6 bar | 32.0 bar | 29.3 bar | 27.2 bar | 25.8 bar | 24.7 bar |
| | | 580 psi | 565 psi | 507 psi | 464 psi | 420 psi | 391 psi | 362 psi | 358 psi |
| D5 | Flange acc. EN 1092-1 PN Class 63 | 63 bar | 61.6 bar | 56.0 bar | 50.4 bar | 46.2 bar | 42.8 bar | 40.6 bar | 38.9 bar |
| | | 913 psi | 884 psi | 812 psi | 725 psi | 667 psi | 609 psi | 580 psi | 564 psi |
| D6 | Flange acc. EN 1092-1 PN Class 100 | 100 bar | 97.7 bar | 97.7 bar | 80.0 bar | 73.3 bar | 68.0 bar | 64.4 bar | 61.8 bar |
| | | 1450 psi | 1416 psi | 1416 psi | 1160 psi | 1058 psi | 986 psi | 928 psi | 896 psi |
| G9 | Internal thread (RCCS30...33) | See tube pressure, for option /DS max. pressure accord ing A4, ASME class 900 | | | | ---------- | | | |
| T9 | Internal thread 1/4´´ NPT (RCCS30...33) | See tube pressure, for option /DS max. pressure according A4, ASME class 900 | | | | ---------- | | | |
| G9 | Internal thread (RCCS34) | See tube pressure, for option /DS max. pressure according A4, ASME class 900 | | | | | | | |
| T9 | Internal thread NPT (RCCS34) | See tube pressure, for option /DS max. pressure according A4, ASME class 900 | | | | | | | |
| | | Process Temperature | | | | | | | |
| | | up to 120ºC (248ºF) | | | | 220ºC (428ºF) | | 300ºC (572ºF) | 350ºC (662ºF) |
| J1 | Flange acc. JIS B 2220 10K | 14 bar (203 psi) | | | | 12 bar (174 psi) | | 10 bar (420 psi) | ---------- |
| J2 | Flange acc. JIS B 2220 20K | 34 bar (493 psi) | | | | 31 bar (449 psi) | | 29 bar (420 psi) | 26 bar (377psi) |
| | | Process Temperature | | | | | | | |
| | | up to 140ºC *) (284ºF) | | | | | | | |
| S2 | Pipe connection up to DN 40 | 40 bar (580 psi) | | | | *) under the restriction using suitable gasket materials | | | |
| | acc. DIN 11851 DN 50 to DN 100 | 25 bar (362 psi) | | | | | | | |
| | above DN 100 | 16 bar (232 psi) | | | | | | | |
| | | Process Temperature | | | | | | | |
| | | up to 150ºC **) (302ºF) | | | | | | | |
| S4 | Clamp connection up to DN 50 | 16 bar (232 psi) | | | | **) under the restriction using suitable gasket materials | | | |
| | acc. DIN 32676 above DN 50 | 10 bar (145 psi) | | | | | | | |
| S8 | Clamp acc. Mini-Clampup to 1/2" | 16 bar (232 psi) | | | | | | | |
| | Clamp acc. Tri-Clamp up to 2"<br>above 2" | 16 bar (232 psi)<br>10 bar (145 psi) | | | | | | | |

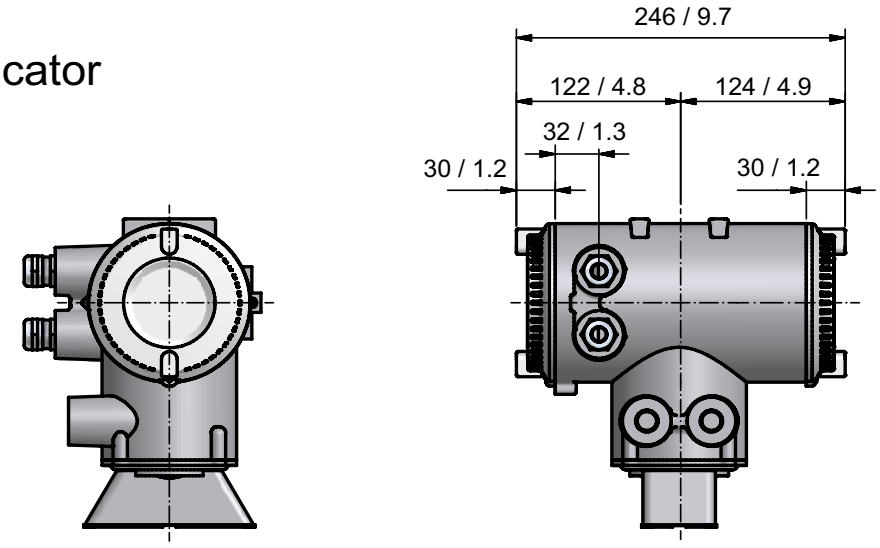
1) all process connections acc. AISI 316L
2) RT = Room Temperature; EN1092: -10ºC to 50ºC; ASME B16.5: -29ºC to 38ºC (-20ºF to 100ºF)

## DIMENSIONS

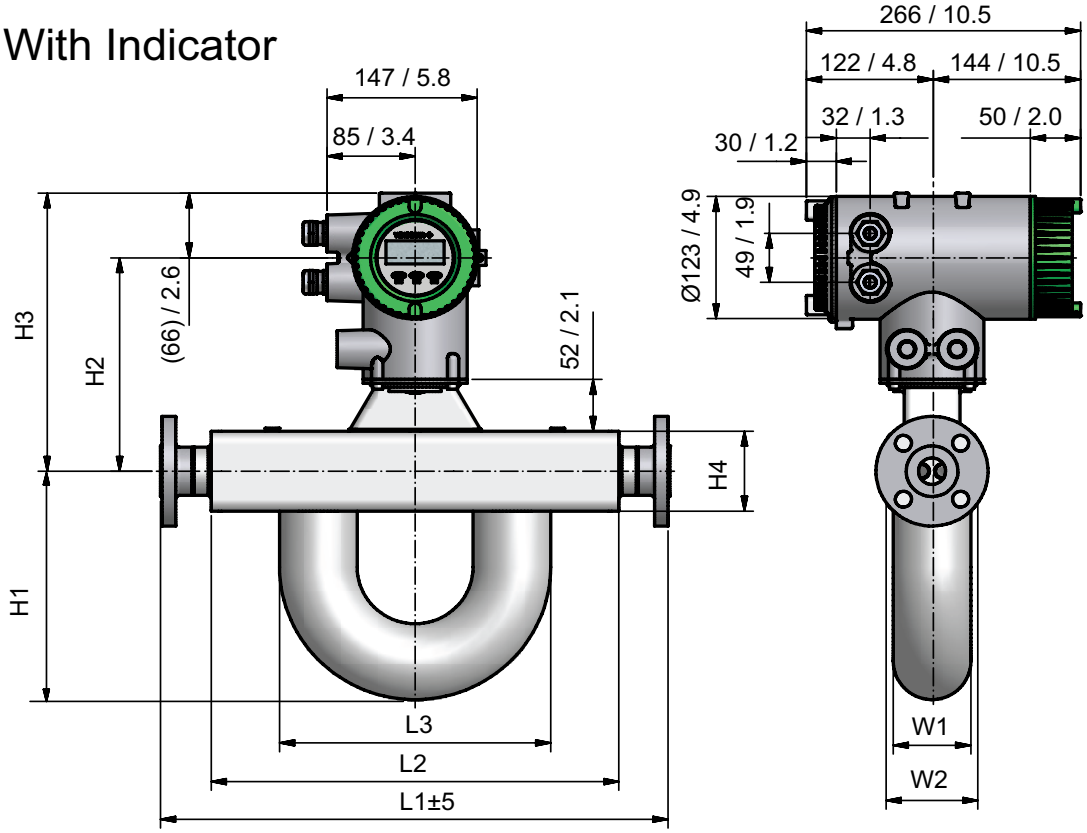
Units: mm/in

### Integral type RCCT34 - 39/IR

Without Indicator




With Indicator




**Note: the flanges dimensions depend on size and pressure rating of the flange.**

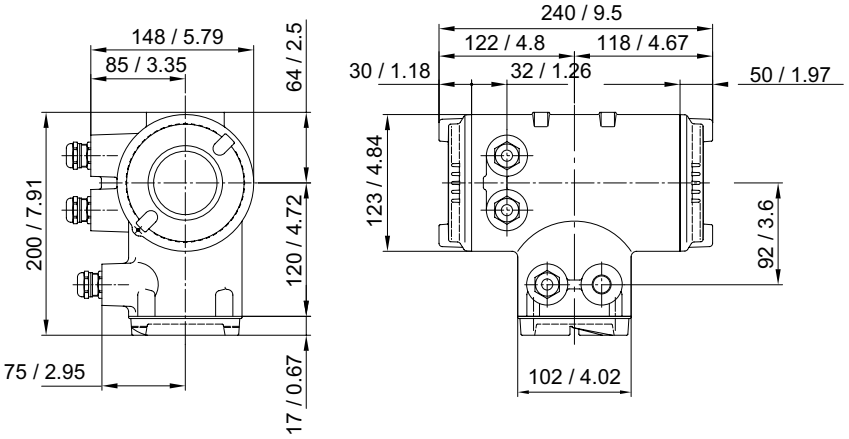
| Model | | L1* | L2 | L3 | H1 | H2 | H3 | H4 | W1 | W2 | Weight* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RCCT34 | mm / in | * | 272 / 10.7 | 212 / 8.3 | 180 / 7.1 | 212 / 7.2 | 278 / 9.7 | 80 / 3.1 | 60 / 2.4 | 80 / 3.1 | 13 kg / 28.7 lb |
| RCCT36 | mm / in | * | 400 / 15.7 | 266 / 10.5 | 233 / 9.2 | 212 / 7.2 | 278 / 9.7 | 80 / 3.1 | 76 / 3 | 90 / 3.5 | 17 kg / 37.5 lb |
| RCCT38 | mm / in | * | 490 / 19.3 | 267 / 10.5 | 274 / 10.4 | 222 / 7.6 | 288 / 10.1 | 100 / 3.9 | 89 / 3.5 | 110 / 4.3 | 26 kg / 57.3 lb |
| RCCT39 | mm / in | * | 850 / 33.5 | 379 / 14.9 | 430 / 16.9 | 240 / 8.3 | 306 / 10.8 | 135 / 5.3 | 129 / 5.1 | 160 / 6.3 | 64 kg / 141 lb |
| RCCT39/IR | mm / in | * | 870 / 34.3 | 455 / 17.9 | 453 / 17.8 | 272 / 9.5 | 338 / 12 | 200 / 7.9 | 155 / 6.1 | 200 / 7.9 | 92 kg / 203 lb |
| RCCT39/XR | mm / in | * | see seperate figure on page 16 | | | | | | | | |

*Weights with smallest flanges

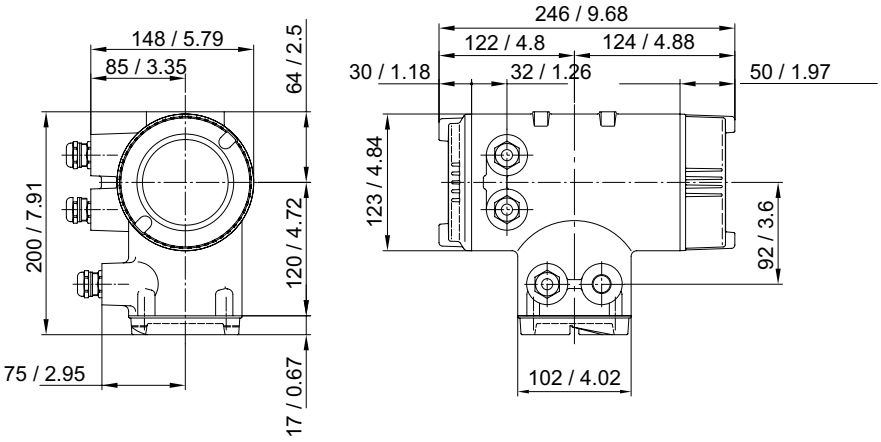
**Remote field-mount converter RCCF31**

Units: mm/in

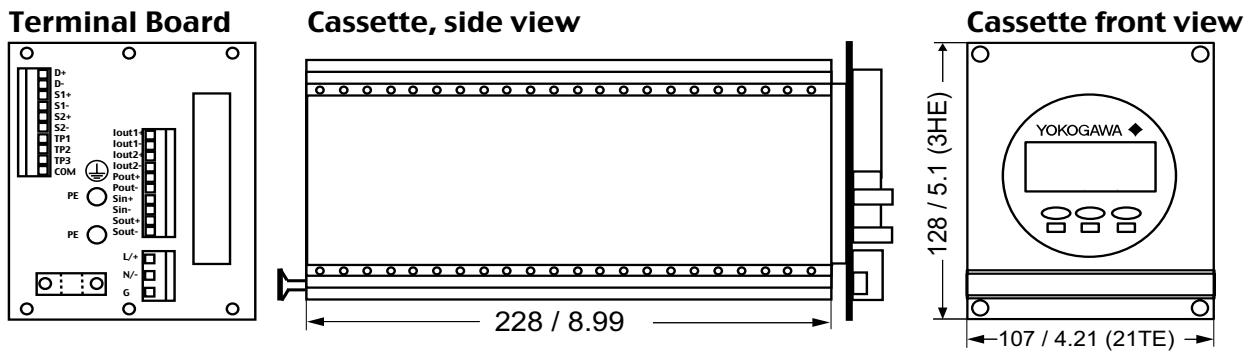
## Without Indicator




## With Indicator




**Remote rack-mount converter RCCR31**

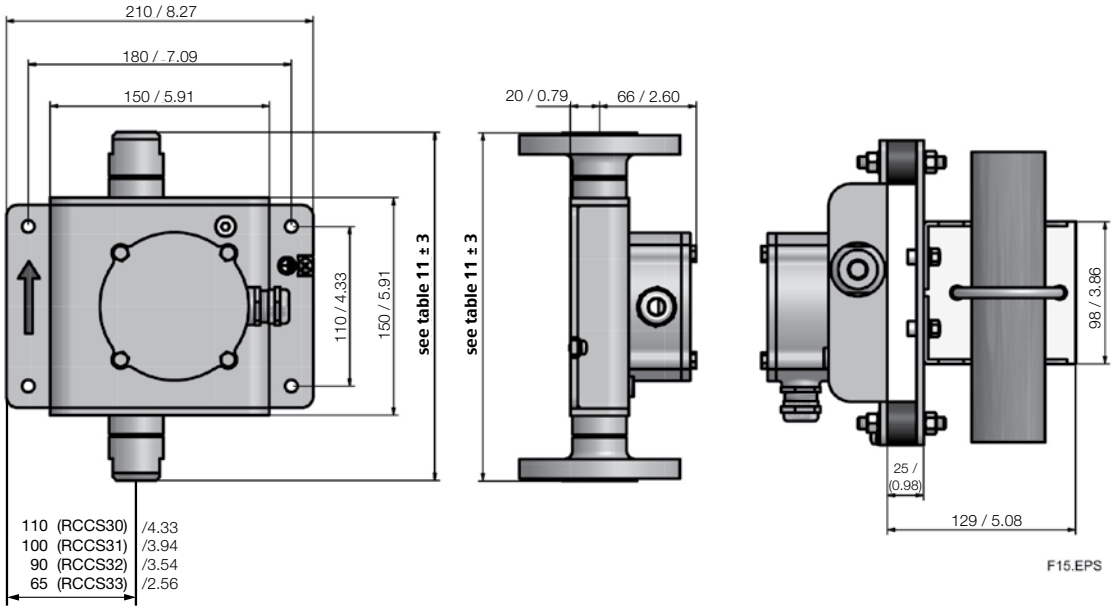



**dimension in mm / in**
**19-inch rack, European standard DIN 41494**
**Weight: 1.5kg / 3.3 lbs**

F17.EPS

## Remote Detector RCCS30 - 33

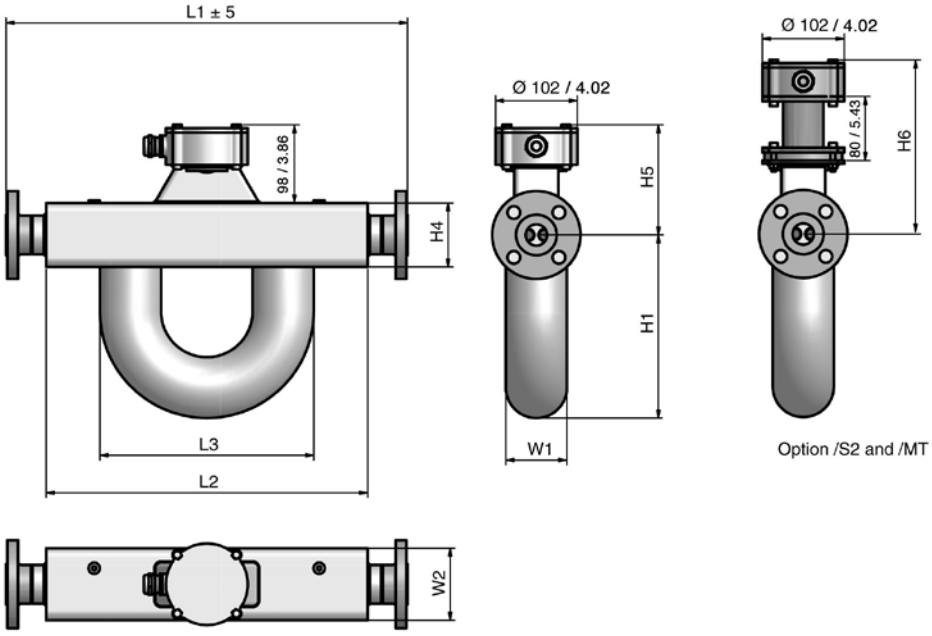
Units: mm/in




Dimensions in mm/inches

Weight (without flanges): 3.5kg / 7.7 lbs

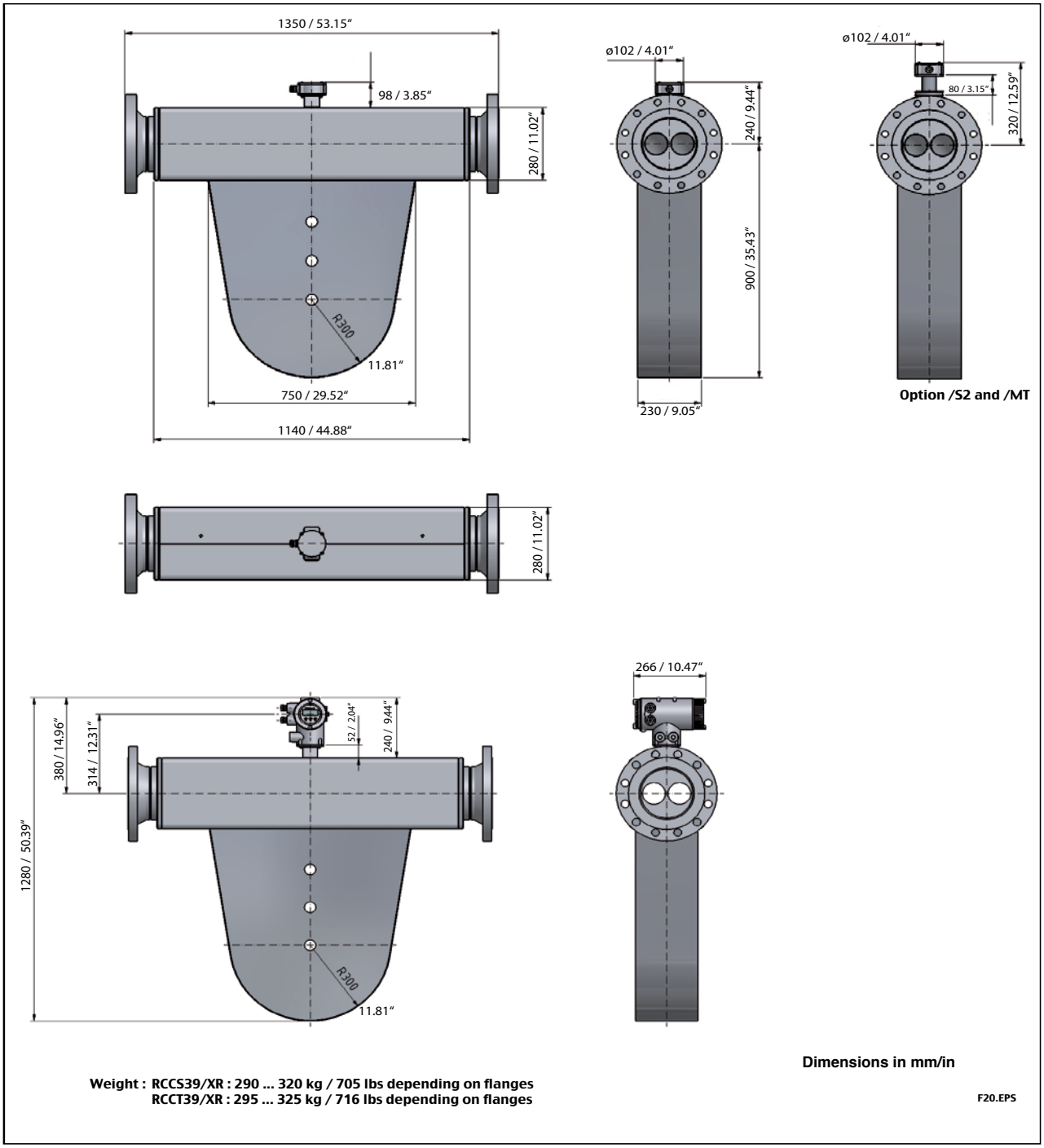
## Remote Detector RCCS34 - 39/IR




Note: The flange dimensions depend on size and pressure rating of the flange.

| Model | | L1 | L2 | L3 | H1 | W1 | W2 | H4 | H5 | H6 | Weight |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RCCS34 | mm/in | see table 11 | 272 / 10.71 | 212 / 8.35 | 180 / 7.09 | 60 / 2.36 | 80 / 3.15 | 80 / 3.15 | 138 / 5.43 | 218 / 8.58 | 9.5 kg / 20.9 lb |
| RCCS36 | mm/in | see table 11 | 400 / 15.75 | 266 / 10.47 | 233 / 9.17 | 76 / 2.99 | 90 / 3.54 | 80 / 3.15 | 138 / 5.43 | 218 / 8.58 | 13 kg / 28.6 lb |
| RCCS38 | mm/in | see table 11 | 490 / 19.49 | 267 / 10.51 | 274 / 10.79 | 89 / 3.5 | 110 / 4.33 | 100 / 3.94 | 148 / 5.83 | 228 / 8.98 | 22 kg / 48.5 lb |
| RCCS39 | mm/in | see table 11 | 850 / 33.46 | 379 / 14.92 | 370 / 14.57 | 129 / 5.08 | 160 / 6.3 | 135 / 5.31 | 166 / 6.54 | 246 / 9.69 | 60 kg / 132 lb |
| RCCS39/IR | mm/in | see table 11 | 870 / 34.25 | 455 / 17.91 | 453 / 17.83 | 155 / 6.1 | 200 / 7.87 | 200 / 7.87 | 198 / 7.8 | 278 / 10.94 | 88 kg / 194 lb |
| RCCS39/XR | mm/in | see separate figure on page 15 | | | | | | | | | |
| Dimensions in mm/in. Weights with smallest flanges. | | | | | | | | | | | |

## Remote Detector RCCS39/XR / Integral type RCCT39/XR



**Remote Detector RCCS30 - 33 with option /Tx (Insulation / Heating)**

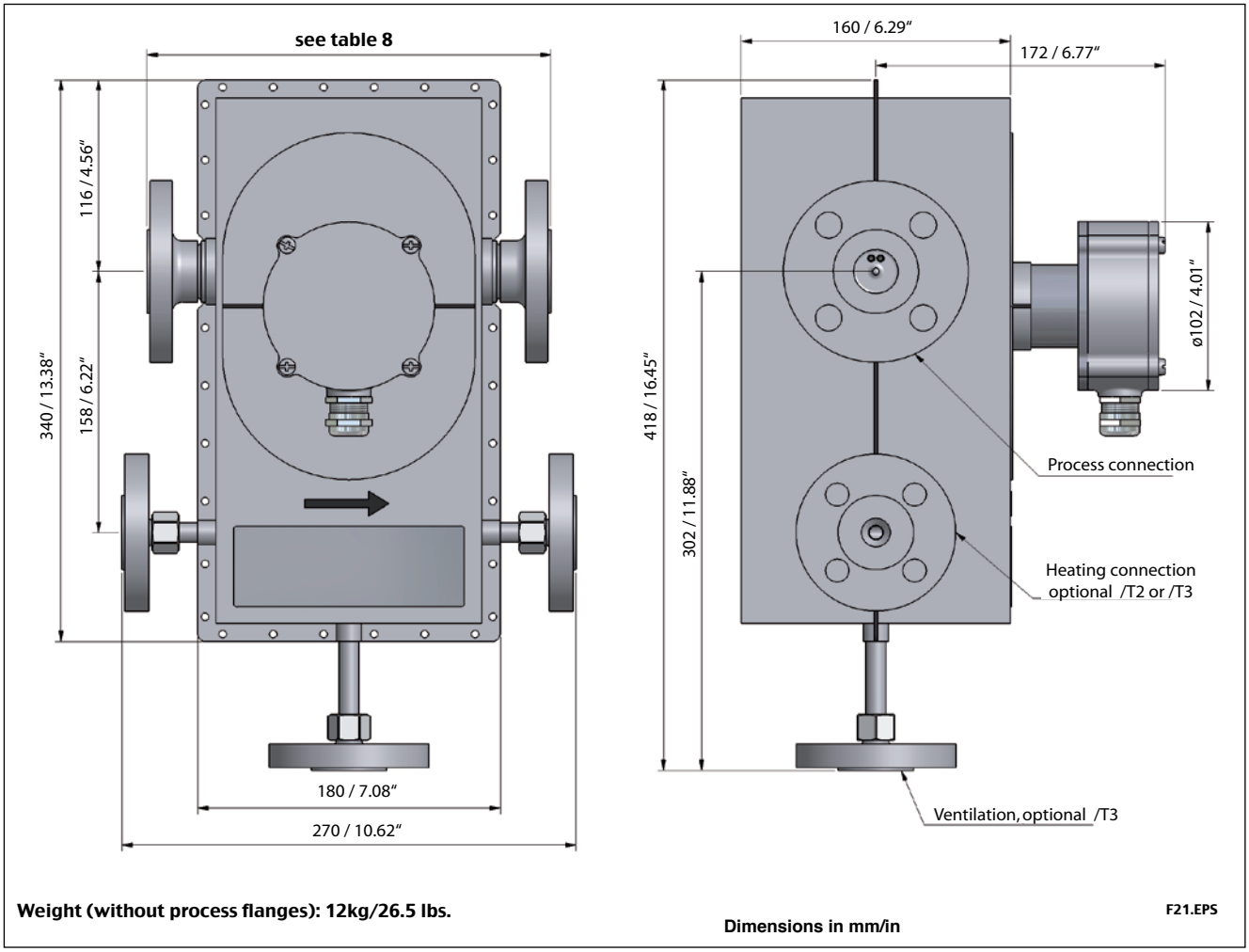
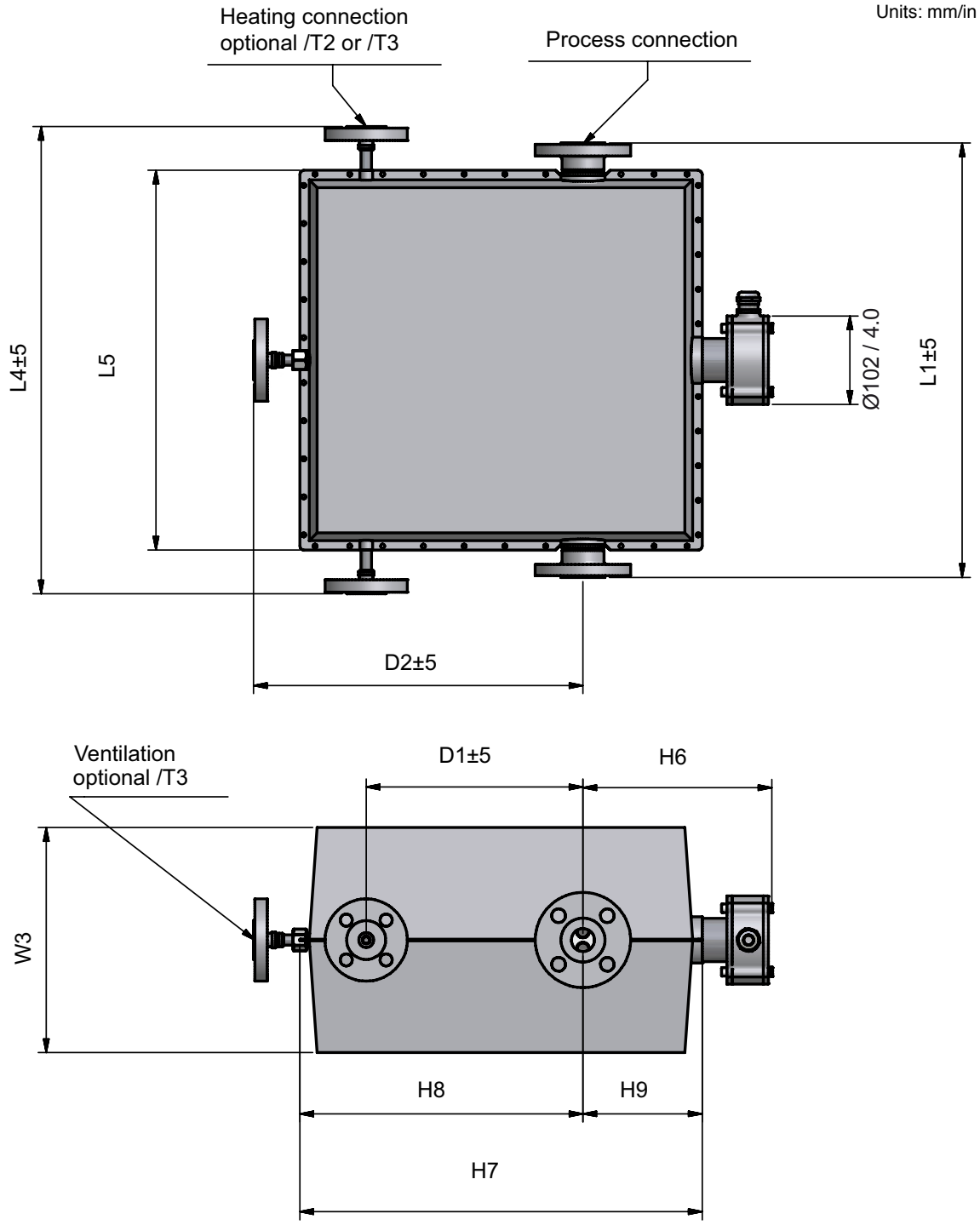



Table 10:Heating connections as standard depending on process connection type:

| Process connection | Standard heating connection*) |
|---|---|
| Ax | ASME ½´´ - 150 |
| Dx | EN DN15 PN40 |
| Jx | JIS 10K DN15 |
| S2 ; S4 | EN DN15 PN40 |
| S8 | ASME ½´´ - 150 |
| G9 | EN DN15 PN40 |
| T9 | ASME ½´´ - 150 |

*) others on request

**Remote Detector RCCS34 - 39/IR with option /Tx (Insulation / Heating)**




| Model | | L1 | L4 | L5 | D1 | D2 | H6 | H7 | H8 | H9 | W3 | weight |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RCCS34 | mm / in | * | 420 / 16.53 | 310 / 12.20 | 200 / 7.87 | 330 / 12.99 | 218 / 9.33 | 411 / 16.18 | 273 / 10.75 | 138 / 5.43 | 240 / 9.45 | 18 kg / 40 lb |
| RCCS36 | mm / in | * | 540 / 21.26 | 439 / 17.28 | 250 / 9.84 | 380 / 14.96 | 218 / 9.33 | 464 / 18.27 | 326 / 12.83 | 138 / 5.43 | 260 / 10.23 | 25 kg / 55 lb |
| RCCS38 | mm / in | * | 640 / 25.20 | 530 / 20.87 | 250 / 9.84 | 430 / 16.93 | 228 / 9.72 | 524 / 20.63 | 376 / 14.80 | 148 / 5.83 | 260 / 10.23 | 37 kg / 82 lb |
| RCCS39 | mm / in | * | 1000 / 39.37 | 884 / 34.80 | 350 / 13.78 | 580 / 22.83 | 246 / 10.43 | 684 / 26.93 | 520 / 20.47 | 165 / 6.50 | 304 / 11.97 | 95 kg / 211 lb |
| RCCS39/IR | mm / in | * | 1040 / 40.95 | 932 / 36.70 | 350 / 13.78 | 590 / 23.23 | 278 / 11.69 | 730 / 28.74 | 530 / 20.87 | 200 / 7.87 | 343 / 13.50 | 125 kg / 278 lb |

# MODEL-, SUFFIX- AND OPTION-CODES

## Integral type RCCT3, Model- and Suffix- Code :

| Model | Suffix Code | Description | Restrictions |
|---|---|---|---|
| RCCT34 | | Nominal value : 2.7 t/h = 45 kg/min (99 lb/min) | |
| RCCT36 | | Nominal value : 10 t/h = 170 kg/min (375 lb/min) | |
| RCCT38 | | Nominal value : 32 t/h = 533 kg/min (1175 lb/min) | |
| RCCT39 | | Nominal value : 100 t/h = 1670 kg/min (3681lb/min) | |
| RCCT39/IR | | Nominal value : 250 t/h = 4170 kg/min (9185 lb/min) | |
| RCCT39/XR | | Nominal value : 500 t/h = 8340 kg/min (18386 lb/min) | only with /HP |
| Power supply | -A | 90-100 - 264 V AC | |
| | -D | 24 V DC | |
| Indicator direction | H1 | Detector installation horizontal, tubes down | recom. for liquid service |
| | H2 | Detector installation horizontal, tubes up | recom. for gas service /GA |
| | V0 | Detector installation vertical | |
| | N0 | Without indicator | |
| Cable conduit connection | M | M20 x 1, female thread with cable glands | |
| | A | ANSI ½˝ NPT, female thread without cable glands | mandatory with /FF1 or /FF3 |
| Process connection size *) | 23 | ¾˝ | see table 11 |
| | 01 | DN 15 , ½“ | see table 11 |
| | 02 | DN 25 , 1“ | see table 11 |
| | 04 | DN 40 , 1 ½“ | see table 11 |
| | 05 | DN 50 , 2“ | see table 11 |
| | 06 | DN 65 , 2 ½“ | see table 11 |
| | 08 | DN 80 , 3“ | see table 11 |
| | 10 | DN 100, 4“ | see table 11 |
| | 12 | DN 125, 5“ | see table 11 |
| | 15 | DN 150, 6” | see table 11 |
| | 20 | DN 200, 8” | see table 1 |
| Process connection rating and style *) | A1 | ASME flange class 150 , process connection dim. + facing acc. ASME B16.5 | see table 11 |
| | A2 | ASME flange class 300 , process connection dim. + facing acc. ASME B16.5 | see table 11 |
| | A3 | ASME flange class 600 , process connection dim. + facing acc. ASME B165 | see table 11 |
| | A4 | ASME flange class 900 , process connection dim. + facing acc. ASME B16.5 | see table 11 |
| | A5 | ASME flange class 1500 , process connection dim. + facing acc. ASME B16. | see table 11 |
| | D2 | EN flange PN 16, process connection dim + facing acc. EN1092 - 1 Form B1 | see table 11 |
| | D4 | EN flange PN 40, process connection dim + facing acc. EN1092 - 1 Form B1 | see table 11 |
| | D5 | EN flange PN 63, process connection dim + facing acc. EN1092 - 1 Form B2 | see table 11 |
| | D6 | EN flange PN 100, process connection dim + facing acc. EN1092 - 1 Form B2 | see table 11 |
| | J1 | JIS flange 10K, JIS B 2220 | see table 11 |
| | J2 | JIS flange 20K, JIS B 2220 | see table 11 |
| | S2 | Thread acc. DIN 11851 | see table 11 |
| | S4 | Clamp, process connection dimensions acc. DIN 32676 | see table 11 |
| | S8 | Clamp, process connection dim. acc. Tri-Clover (Tri-Clamp) and ½˝ Mini Clamp | see table 11 |
| | G9 | G, female thread | see table 11 |
| | T9 | NPT, female thread | see table 11 |
| Material of wetted parts *) | SL | Stainless steel 316L (1.4404) | |
| | HC | Hastelloy C-22 (2.4602) | only RCCT34 to 39/IR |

*) see selection table process connection and materials (table 11)

## Integral type RCCT3, Option- Code :

| Options | Option code | Description | Restrictions |
|---|---|---|---|
| Hazardous Area Approvals | /KF1 | ATEX Flame proof converter + Intrinsic safe detector | with /HP for gas group IIB |
| | /KF2 | ATEX Flame proof converter + Intrinsic safe detector + Intrinsic safe outputs [1)] | with /HP for gas group IIB |
| | /FF1 | FM approval for USA+Canada, Flame proof converter + Intrinsic safe detector | only with cable conduit ´A´; with /HP not for groups A and B |
| | /EF1 | IECEx Flame proof converter + Intrinsic safe detector | with /HP for gas group IIB |
| | /EF2 | IECEx Flame proof converter + Intrinsic safe detector + Intrinsic safe outputs [1)] | with /HP for gas group IIB |
| | /UF1 | INMETRO Flame proof converter + Intrinsic safe detector | with /HP for gas group IIB |
| | /UF2 | INMETRO Flame proof converter + Intrinsic safe detector + Intrinsic safe outputs [1)] | with /HP for gas group IIB |
| Custody Transfer Measurement acc. OIML R 117-1 | /Q01 | European MID Approval (fluids other than water) (refer to GS 01R04B07-00E) | |
| GOST Approval | /QR1 | Russian GOST approval | see page 8 |
| | /QR2 | Kazakh GOST approval | see page 8; not for RCCT39/XR; not with /HP |
| | /QR3 | Uzbekistan GOST approval | see page 8; not for RCCT39/XR; not with /HP |
| Dual Seal Approval | /DS | Dual Seal approval (conform with ANSI/ISA-12.27.01) | only with /FF1; not with process connection A5; ~~not with /FB~~ |
| | /RD | Rupture disk | not wit RCCT39/XR, preferable with /GA, mandatory if /DS+/GA is selected |

[1)] This is a flame proof device, not an intrinsic safe device!

## Integral type RCCT3, Option- Code (continued) :

| Options | Option code | Description | Restrictions |
|---|---|---|---|
| High Driving Power | /HP | High Driving Power | not for RCCT34, recommended for RCCT36 to 39, strongly recommended for RCCT39/IR, mandatory for RCCT39/XR |
| Fieldbus Communication | /FB | Digital communication Foundation Fieldbus protocol (refer to GS 01R04B05-00E) | |
| Active Pulse Output | /AP | One active pulse output | /KF2, /EF2, /UF2, /NM |
| NAMUR Switch | /NM | One pulse output acc. to EN 60947-5-6 (NAMUR) | not with /AP |
| Analog Alarm Levels | /NA | Analog output alarm levels 2.4 mA or 21.6 mA<br>(Standard is acc. to NAMUR rec. 43) | |
| Tag Number | /BG | With customer specified tag number on name plate | max. 16 digits |
| HART Tag Number (Software Tag) | /BT1 | With customer specified tag number for HART communication in converter | 8 digits for tag, 22 digits for long tag; not with /FB |
| Flange Facing | /DN<br>/RJ | Flange with safety grooves acc. to EN 1092-1 form D<br>Ring Type Joint Flanges | only for D2 to D6; not HC<br>only for A3, A4, A5; not HC |
| Gas Measurement | /GA | Gas measurement, special factory adjustments and settings | to be conform with ANSI/ISA-12.27.01 select /RD |
| Special Calibration | /K2 [2]<br><br>/K4 /<br>K5 [2]<br><br>/K6 | Custom 5 pts mass-/volume-flow calibration using water with factory certificate (traceable to German national standards)<br>Density adjustment + thermal treatment; (accuracy: 0.001 g/cm³)<br>Custom 10 pts mass-/volume-flow calibration using water with DKD certificate (according EN-17025:2005)<br>Density calibration with 3 different fluids incl. individual temperature compensation with certificate (accuracy: 0.0005 g/cm³) | <br><br>only RCCT34 to 39; not with /GA<br><br><br>only RCCT34 to 39; not with /GA ; ~~not with /FB~~;<br>not with sanitary options |
| Certificates | /P2<br>/P3<br>/P6<br>/P8<br>/H1 | Certificate of compliance with the order acc. to EN 1024:2004 -2.1<br>As /P2 + Test report acc. to EN 1024: 2004 -2.2 (QIC)<br>Material certificate acc. to EN 1024: 2004 -3.1<br>Pressure test report measuring system<br>Oil and fat free for wetted surface acc. to ASTM G93-03 level C | |
| Sanitary Type | /SF1<br><br>/SF2<br>/SA<br>/SE | Surface roughness Ra = 0.8 µm<br><br>As /SF1 + Test report roughness of wetted parts<br>As /SF2 + 3A- declaration of conformity and 3A- mark<br>As /SF2 + EHEDG certificate | not RCCT39/XR; only process connections S2, S4, S8; see also restrictions in table 11<br><br>not with process connection S2<br>not with process connection S2 |
| Customer Presetting | /PS | Presetting sheet with customer data | has to be issued with the order |
| Housing Pressure Test | /J1 | Rupture pressure proof test and certificate:<br>60 bar (RCCT34, RCCT36), 40 bar (RCCT38), 10 bar (RCCT39, RCCT39/IR) | not for RCCT39/XR |
| X-Ray Examination | /RT | X-ray examination of flange welding | only material SL |
| PMI Examination | /PM6 | PAMI test (6 test points: process connection inlet + outlet, measuring tubes, flow divider inlet + outlet) [3] | |
| Dye Penetration Test | /PT | Dye penetration test of flange welding | |
| Epoxy Coating | /X1 | Epoxy coating of converter housing | |
| Concentration Measurement [4] | /CST<br>/Cxx | Standard concentration measurement<br>Advanced concentration measurement, details see table „Advanced Concentration Measurement Options“ | |
| Instruction Manuals | /IEn<br>/IDn<br>/IFn | Quantity of instruction manuals in English<br>Quantity of instruction manuals in German<br>Quantity of instruction manuals in French | n = 1 to 3 selectable [5]<br>n = 1 to 3 selectable [5]<br>n = 1 to 3 selectable [5] |
| Quick Delivery | /QD | Delivery within 24 hours from factory | not RCCT39/IR, RCCT39/XR,<br>not with process connection size 23, 12,<br>only with process connection rating A1, A2, D4,<br>only material SL,<br>only for options /KF1, /FF1, /EF1, /UF1, /AP, /NM, /NA, /BG, /P2, /P3, /P8, /CST, /Cxx, /IEn, /IDN , /IFn |
| Special order | /Z | Special design must be specification an extra sheet | |

[2] Calibration order sheet must be delivered with the order. This is available on the Flow Center Page at Coriolis/RCCx3/Technical Information.
[3] Measuring tube PAMI test is performed per delivery batch.
[4] For detailed information please see TI 01R04B04-04E-E. Concentration measurement is recommended with option /K6.
[5] If no instruction manual is selected, only a CD with instruction manuals is shipped with the instrument. More than 3 manuals of one language on request.

## Remote detector RCCS3, Model- and Suffix- Code :

| Model | Suffix Code | Description | Restrictions |
|---|---|---|---|
| RCCS30 | | Nominal value : 0.045 t/h = 0.75 kg/min (1.65 lb/min) | |
| RCCS31 | | Nominal value : 0.17 t/h = 2.8 kg/min (6.2 lb/min) | |
| RCCS32 | | Nominal value : 0.37 t/h = 6.2 kg/min (13.5 lb/min) | |
| RCCS33 | | Nominal value : 0.9 t/h = 15 kg/min (33 lb/min) | |
| RCCS34 | | Nominal value : 2.7 t/h = 45 kg/min (99 lb/min) | |
| RCCS36 | | Nominal value : 10 t/h = 170 kg/min (375 lb/min) | |
| RCCS38 | | Nominal value : 32 t/h = 533 kg/min (1,175 lb/min) | |
| RCCS39 | | Nominal value : 100 t/h = 1670 kg/min (3,681 lb/min) | |
| RCCS39/IR | | Nominal value : 250 t/h = 4170 kg/min (9,185 lb/min) | select affiliated RCCF31 or RCCR31 with /HP |
| RCCS39/XR | | Nominal value : 500 t/h = 8340 kg/min (18,340 lb/min) | |
| Cable conduit connection | -M | M20 x 1, female thread with cable glands | |
| | -A | ANSI ½´´ NPT, female thread only with cable gland for detector connection | mandatory with /FS1 |
| Process connection size *) | 41 | ¼´´ | see table 11 |
| | 01 | DN 15 , ½“ | see table 11 |
| | 23 | ¾´´ | see table 11 |
| | 02 | DN 25 , 1“ | see table 11 |
| | 04 | DN 40 , 1 ½“ | see table 11 |
| | 05 | DN 50 , 2“ | see table 11 |
| | 06 | DN 65 , 2 ½“ | see table 11 |
| | 08 | DN 80 , 3“ | see table 11 |
| | 10 | DN 100, 4“ | see table 11 |
| | 12 | DN 125, 5“ | see table 11 |
| | 15 | DN 150, 6” | see table 11 |
| | 20 | DN 200, 8” | see table 11 |
| Process connection rating and style *) | A1 | ASME flange class 150, process connection dim. + facing acc. ASME B16.5 | see table 11 |
| | A2 | ASME flange class 300, process connection dim. + facing acc. ASME B16.5 | see table 11 |
| | A3 | ASME flange class 600, process connection dim. + facing acc. ASME B16.5 | see table 11 |
| | A4 | ASME flange class 900, process connection dim. + facing acc. ASME B16.5 | see table 11 |
| | A5 | ASME flange class 1500, process connection dim. + facing acc. ASME B16.5 | see table 11 |
| | D2 | EN flange PN 16, process connection dim + facing acc. EN1092 - 1 Form B1 | see table 11 |
| | D4 | EN flange PN 40, process connection dim + facing acc. EN1092 - 1 Form B1 | see table 11 |
| | D5 | EN flange PN 63, process connection dim + facing acc. EN1092 - 1 Form B2 | see table 11 |
| | D6 | EN flange PN 100, process connection dim + facing acc. EN1092 - 1 Form B2 | see table 11 |
| | J1 | JIS flange 10K , JIS B 2220 | see table 11 |
| | J2 | JIS flange 20K , JIS B 2220 | see table 11 |
| | S2 | Thread acc. DIN 11851 | see table 11 |
| | S4 | Clamp, DIN inside diameter | see table 11 |
| | S8 | Clamp, process connection dimensions acc. Tri-Clover (Tri-Clamp) and ½´´ Mini Clamp | see table 11 |
| | G9 | G female thread | see table 11 |
| | T9 | NPT female thread | see table 11 |
| Material of wetted parts *) | SH | 316L (1.4404) and Hastelloy C-22 (2.4602) for tube | only RCCS30 ... 33 |
| | SL | Stainless steel 316L (1.4404) | only RCCS34 … 39/XR |
| | HC | Hastelloy C-22 (2.4602) | only RCCS34 … 39/IR |

*) see selection table process connection and materials (table 11)

## Remote detector RCCS3, Option- Code :

| Options | Option code | Description | Restrictions |
|---|---|---|---|
| Hazardous Area Approvals [1] | /KS1<br>/FS1<br>/ES1<br>/US1 | ATEX intrinsically safe approval<br>FM approval for USA + Canada<br>IECEx intrinsically safe approval<br>INMETRO intrinsically safe approval for Brazil | only with cable conduit ´A´ |
| Custody Transfer Measurement acc. OIML R 117-1 | /Q01 | European MID Approval (fluids other than water) (refer to GS 01R04B07-00E) | |
| GOST Approval [1] | /QR1<br>/QR2<br>/QR3 | Russian GOST approval<br>Kazakh GOST approval<br>Uzbekistan GOST approval | see page 8; not with /LT<br>see page 8; not for RCCS39/XR; not with /LT<br>see page 8; not for RCCS39/XR; not with /LT |
| Dual Seal Approval | /DS<br><br>/RD | Dual Seal approval (conform with ANSI/ISA-12.27.01)<br><br>Rupture disk | only RCCS34 to 39/XR; only with /FS1; not with process connection A5<br>only RCCS34 to 39/IR, preferable with /GA, not with /Tx, mandatory if /DS + /GA is selected |
| Tag Number | /BG | With customer specified tag number on name plate | max. 16 digits |
| Flange Facing | /DN<br>/RJ | Flange with safety grooves acc. to EN 1092-1 form D<br>Ring Type Joint Flanges | only for D2 to D6; not HC<br>only for A3, A4, A5; not HC |
| Gas Measurement | /GA | Gas measurement, special factory adjustments and settings | select affiliated RCCF31 or RCCR31 with /GA;<br>to be conform with ANSI/ISA-12.27.01 select /RD |
| Low temperature version | /LT | -200°C < $T_{medium}$ < 150°C (-328˚F<$T_{medium}$<302˚F) | not RCCS30 to 33; not with /KS1, /FS1, /ES1, /US1, /MT, /HT, /T1, /T2, /T3, /QR1, /QR2, /QR3 |
| Extended temperature range | /MT | -70°C < $T_{medium}$ < 230°C (-94˚F<$T_{medium}$<446˚F) | not RCCS30 to 33; always with /S2 or /Tx;<br>remote cable RCCY033/034 recommended |
| High temperature version | /HT | $T_{medium}$ up to 350°C (662˚F) | only with /Tx; only RCCS34 to 39/IR;<br>remote cable RCCY033/034 recommended |
| Special Calibration | /K2 [2]<br><br>/K4<br>/K5 [2]<br><br>/K6 | Custom 5 pts mass-/volume-flow calibration using water with factory certificate (traceable to German national standards)<br>Density adjustment + thermal treatment; (accuracy: 0.001 g/cm³)<br>Custom 10 pts mass-/volume-flow calibration using water with DKD certificate (according EN-17025:2005)<br>Density calibration with 3 different fluids incl. individual temperature compensation with certificate (accuracy: 0.0005 g/cm³) | <br><br>only RCCS31 to 39; not with /GA<br>not RCCS30<br><br>only RCCS32 to 39; not with /GA; not with sanitary options; only available if converter is also ordered |
| Certificates | /P2<br>/P3<br>/P6<br>/P8<br>/H1 | Certificate of compliance with the order acc. to EN 1024:2004 -2.1<br>As /P2 + Test report acc to EN 1024: 2004 -2.2 (QIC)<br>Material certificate acc to EN 1024: 2004 -3.1<br>Pressure test report measuring system<br>Oil and fat free for wetted surface acc. to ASTM G93-03 level C | |
| Sanitary Type | /SF1<br><br>/SF2<br>/SA<br>/SE | Surface roughness Ra = 0.8 $\mu$m (32$\mu$in)<br><br>As /SF1 + Test report roughness of wetted parts<br>As /SF2 + 3A- declaration of conformity and 3A- mark<br>As /SF2 + EHEDG- certificate | only RCCS34 to 39/IR; only process connections S2, S4, S8; see also restrictions in table 11<br><br>not with process connection S2<br>not with process connection S2 |
| Mounting set | /PD | 2 inch pipe mounting set | only RCCS30 to 33; not with /Tx; recommended for RCCS30 |
| Housing Pressure Test | /J1 | Rupture pressure proof test and certificate:<br>60 bar (RCCS34, RCCS36), 40 bar (RCCS38), 10 bar (RCCS39, RCCS39/IR) | not for RCCS30 to 33 + RCCS39/XR |
| Customer insulation / Heating | /S2 | Terminal box on extension for high or low process temperature | not with /T1 ... /T3 |
| Factory Insulating / Heating | /T1<br>/T2<br>/T3 | Insulation<br>Insulation + Heat carrier heating<br>Insulation + Heat carrier heating with ventilation | not for RCCS39/XR<br>not for RCCS39/XR<br>not for RCCS39/XR |
| X-Ray Examination | /RT | X-ray examination of flange welding | not with material HC |
| PMI Examination | /PM4<br><br>/PM6 | PAMI test (4 test points: process connection inlet + outlet, flow divider inlet + outlet) [3]<br>PAMI test (6 test points: process connection inlet + outlet, measuring tubes, flow divider inlet + outlet) [3] | only RCCS30 to 33<br><br>not RCCS30 to 33 |
| Dye Penetration Test | /PT | Dye penetration test of flange welding | |
| Stainless steel cable gland | /BS | Cable gland stainless steel | |
| Quick Delivery | /QD | Delivery within 24 hours from factory | only RCCS34 to 39<br>not with process connection size 23, 12,<br>only with process connection rating A1, A2, D4,<br>only material SL,<br>only for options /KS1, /FS1, /ES1, /US1, /BG, /P2, /P3, /P8 |
| Special order | /Z | Special design must be specification an extra sheet | |

[1] Select affiliated converter RCCF31/RCCR31 with the same approval type (e.g. ATEX).
[2] Calibration order sheet must be delivered with the order. This is available on the Flow Center Page at Coriolis/RCCx3/Technical Information.
[3] Measuring tube PAMI test is performed per delivery batch.

## Remote field-mount converter RCCF31, Model-, Suffix- and Option- Code :

| Model | Suffix Code | Option Code | Description | Restrictions |
|---|---|---|---|---|
| RCCF31 | | | Remote field-mount converter to be connected to RCCS3;<br>when ordered without detector combination option /NC must be selected | |
| Power supply | -A<br>-D | | 90 - 264 V AC<br>24 V DC | |
| Indicator direction | H2<br>N0 | | With indicator<br>Without indicator | |
| Cable conduit connection | M<br>A | | M20 x 1, female thread with cable glands<br>ANSI ½´´ NPT, female thread, only cable gland for detector connection | <br>mandatory with /FF1, /FF3 |

| | | | |
|---|---|---|---|
| Hazardous Area Approvals [2] | /KF1<br>/KF2<br>/FF1<br><br>/EF1<br>/EF2<br>/UF1<br>/UF2 | ATEX Flame proof converter + Intrinsic safe detector<br>ATEX Flame proof converter + Intrinsic safe detector + Intrinsic safe outputs [1]<br>FM approval for USA+Canada, Flame proof converter + Intrinsic safe detector<br>IECEx Flame proof converter + Intrinsic safe detector<br>IECEx Flame proof converter + Intrinsic safe detector + Intrinsic safe outputs [1]<br>INMETRO Flame proof converter + Intrinsic safe detector<br>INMETRO Flame proof converter + Intrinsic safe detector + Intrinsic safe outputs [1] | with /HP for gas group IIB<br>with /HP for gas group IIB<br>only with cable conduit ´A´; with /HP not for groups A and B<br>with /HP for gas group IIB<br>with /HP for gas group IIB<br>with /HP for gas group IIB<br>with /HP for gas group IIB |
| Custody Transfer Measurement acc. OIML R 117-1 | /Q01 | European MID Approval (fluids other than water) (refer to GS 01R04B07-00E) | |
| GOST Approval [2] | /QR1<br>/QR2<br>/QR3 | Russian GOST approval<br>Kazakh GOST approval<br>Uzbekistan GOST approval | see page 8<br>see page 8; not with /HP<br>see page 8; not with /HP |
| Fieldbus Communication | /FB | Digital communication (Foundation Fieldbus protocol refer to GS 01R04B05-00E) | |
| High Driving Power | /HP | High Driving Power | not for combination with RCCS30 to 34,<br>recommended for combination with RCCS36 to 39,<br>strongly recommended for combination with RCCS39/IR,<br>mandatory for combination with RCCS39/XR |
| Active Pulse Output | /AP | One active pulse output | /KF2, /EF2, /UF2, /NM |
| NAMUR Switch | /NM | One pulse output acc. EN 60947-5-6 (NAMUR) | not with /AP |
| Analog Alarm Levels | /NA | Analog output alarm levels 2.4 mA or 21.6 mA<br>(Standard is acc. NAMUR rec. 43) | |
| Tag Number | /BG | With customer specified tag number on name plate | max. 16 digits |
| HART Tag Number (Software Tag) | /BT1 | With customer specified tag number for HART communication in converter | 8 digits for tag, 22 digits for long tag |
| Gas Measurement | /GA | Gas measurement, special factory adjustments and settings | select affiliated RCCS3 with /GA |
| No Combination | /NC | No combination with detector | |
| Customer Presetting | /PS | Presetting sheet with customer data | has to be issued with the order |
| Epoxy Coating | /X1 | Epoxy coating of converter housing | |
| Concentration Measurement [3] | /CST<br>/Cxx | Standard concentration measurement<br>Advanced concentration measurement, details see table „Advanced Concentration Measurement Options“ | |
| Instruction Manuals | /IEn<br>/IDn<br>/IFn | Quantity of instruction manuals in English<br>Quantity of instruction manuals in German<br>Quantity of instruction manuals in French | n = 1 to 3 selectable [4]<br>n = 1 to 3 selectable [4]<br>n = 1 to 3 selectable [4] |
| Quick Delivery | /QD | Delivery within 24 hours from factory | not with /KF2, EF2, /UF2, /GA, /QR1, /QR2, /QR3, /PS, /X1 |
| Special order | /Z | Special design must be specification an extra sheet | |

[1] This is a flame proof device, not an intrinsic safe device!
[2] Select affiliated RCCS3 with the same approval type (e.g. /KFx with /KS1).
[3] For detailed information please see TI 01R04B04-04E-E. Option /K6 of RCCS3 is recommended with concentration measurement.
[4] If no instruction manual is selected, only a CD with instruction manuals is shipped with the instrument. More than 3 manuals of one language on request.

## Remote rack-mount converter RCCR31, Model-, Suffix- and Option- Code :

| Model | Suffix Code | Option Code | Description | Restrictions |
|---|---|---|---|---|
| RCCR31 | | | Remote converter for 19´´ rack mounting to be connected to RCCS3 | |
| Power supply | -A<br>-D | | 90 - 264 V AC<br>24 V DC | |
| Hazardous Area Approvals [1] | | /KS1<br>/FS1<br>/ES1<br>/US1 | ATEX associated apparatus for intrinsic safe detector connection for gas group IIC<br>FM associated apparatus for intrinsic safe detector connection<br>IECEx associated apparatus for intrinsic safe detector connection for gas group IIC<br>INMETRO associated apparatus for intrinsic safe detector connection for gas group IIC | with /HP for gas group IIB<br>with /HP not for gas groups A and B<br>with /HP for gas group IIB<br>with /HP for gas group IIB |
| GOST Approval [1] | | /QR1 | Russian GOST approval | see page 8 |
| High Driving Power | | /HP | High Driving Power | not for combination with RCCS30 to 34, recommended for combination with RCCS36 to 39, strongly recommended for combination with RCCS39/IR, mandatory for combination with RCCS39/XR |
| Active Pulse Output | | /AP | One active pulse output | not with /NM |
| NAMUR Switch | | /NM | One pulse output acc. EN 60947-5-6 (NAMUR) | not with /AP |
| Analog Alarm Levels | | /NA | Analog output alarm levels 2.4 mA or 21.6 mA<br>(Standard is acc. NAMUR rec. 43) | |
| Tag Number | | /BG | With customer specified tag number on name plate | max. 16 digits |
| HART Tag Number (Software Tag) | | /BT1 | With customer specified tag number for HART communication in converter | 8 digits for tag, 22 digits for long tag |
| Gas Measurement | | /GA | Gas measurement, special factory adjustments and settings | select affiliated RCCS3 with /GA |
| No Combination | | /NC | No combination with detector | |
| Customer Presetting | | /PS | Presetting sheet with customer data | has to be issued with the order |
| Concentration Measurement [2] | | /CST<br>/Cxx | Standard concentration measurement<br>Advanced concentration measurement, details see table „Advanced Concentration Measurement Options“ | |
| Subrack | | /SR1<br>/SR2 | Subrack for 2 converter RCCR31 with mounting<br>Subrack for 4 converter RCCR31 with mounting | |
| Instruction Manuals | | /IEn<br>/IDn<br>/IFn | Quantity of instruction manuals in English<br>Quantity of instruction manuals in German<br>Quantity of instruction manuals in French | n = 1 to 3 selectable [3]<br>n = 1 to 3 selectable [3]<br>n = 1 to 3 selectable [3] |
| Special order | | /Z | Special design must be specification an extra sheet | |

[1] Select affiliated RCCS3 with the same approval type (e.g. /KS1 with /KS1).
[2] For detailed information please see TI 01R04B04-04E-E. Option /K6 of RCCS3 is recommended with concentration measurement.
[3] If no instruction manual is selected, only a CD with instruction manuals is shipped with the instrument. More than 3 manuals of one language on request.

## Remote cable RCCY03, Model-, Suffix- and Option- Code :

| Model | Suffix Code | Option Code | Description | Restrictions |
|---|---|---|---|---|
| RCCY031<br>RCCY032<br>RCCY033<br>RCCY034 | | | Length in ´meter´<br>Length in ´feet´<br>Length in ´meter´<br>Length in ´feet´ | max. ambient temperature 70°C; with /FFx or /FS1: 50°C (158ºF) - (122ºF)<br>max. ambient temperature 70°C; with /FFx or /FS1: 50°C (158ºF) - (122ºF)<br>max. ambient temperature 105°C; with /FFx or /FS1: 85°C (221ºF) - (185ºF)<br>max. ambient temperature 105°C; with /FFx or /FS1: 85°C (221ºF) - (185ºF) |
| Cable ends | -0<br>-1 | | No termination, with one termination kit<br>Terminated | <br>not RCCY033 |
| Cable length | Lxxx | | Enter the length | max. 300m / 999ft (with /FFx or /FS1 max. 50m / 165ft);<br>the following lengths can be ordered (e.g. 3m = L003):<br>RCCY031-0: 3m, 5m, 10m, 15m, 30m, 50m, 100m, 150m, 200m, 250m, 300m<br>RCCY031-1: 3m, 5m, 10m, 15m, 30m, 50m<br>RCCY032-0: 10ft, 15ft, 30ft, 50ft, 100ft, 150ft, 300ft, 500ft, 1000ft<br>RCCY032-1: 10ft, 15ft, 30ft, 50ft, 100ft, 150ft<br>RCCY033-0: 3m, 5m, 10m, 15m, 50m, 100m, 150m, 300m<br>RCCY034-0: 10ft, 30ft, 50ft, 100ft, 150ft, 300ft, 500ft, 1000ft<br>RCCY034-1: 10ft, 15ft, 30ft, 50ft, 100ft, 150ft |
| Options:<br>Hazardous area installation<br>Termination kits<br>Quick delivery | | <br>/KS1<br>/TKxx<br>/QD | <br>Blue cable for Ex-i indication<br>Quantity of additional termination kits<br>Delivery within 24 hours from factory | <br><br>xx = 01 to 99<br>only RCCY031-1, L003, L005, L010 |

## Advanced Concentration Measurement Options (others on request), recommended with option /K6:

| Option | Display | Components | Concentration range | Temp. range | Source of concentration- / density table |
|---|---|---|---|---|---|
| /C01 | °Brix | Sugar / Water | 0 - 85 °Brix | 0-80∞C/32-176∞F | PTB- Messages 100 5/90: „The density of watery Saccarose solutions after the introduction of the international temperature scale of 1990 (ITS1990)“ Table 5 |
| /C02 | WT% | NaOH / Water | 2 - 50 WT% | 0-100∞C/32-212∞F | D´Ans-Lax, Handbook for chemists and physicists Vol.1, 3rd edition, 1967 |
| /C03 | WT% | KOH / Water | 0 - 60 WT% | 54-100∞C/129-212∞F | D´Ans-Lax, Handbook for chemists and physicists Vol.1, 3rd edition, 1967 |
| /C04 | WT% | $NH_4NO_3$ / Water | 1 - 50 WT% | 0-80∞C/32-176∞F | Source undefined |
| /C05 | WT% | $NH_4NO_3$ / Water | 20 - 70 WT% | 20-100∞C/68-212∞F | Source undefined |
| /C06 [1)] | WT% | HCl / Water | 22 - 34 WT% | 20-40∞C/68-104∞F | D´Ans-Lax, Handbook for chemists and physicists Vol.1, 3rd edition, 1967 |
| /C07 | WT% | $HNO_3$ / Water | 50 - 67 WT% | 10-60∞C/50-140∞F | Source undefined |
| /C09 | WT% | $H_2O_2$ / Water | 30 - 75 WT% | 0-100∞C/32-212∞F | Source undefined |
| /C10 | WT% | Ethylene Glycol / Water | 10 - 50 WT% | 4-44∞C/39-111∞F | Source undefined |
| /C11 | WT% | Amylum = starch / Water | 33 - 43 WT% | -20-40∞C/-4-104∞F | Source undefined |
| /C12 | WT% | Methanol / Water | 35 - 60 WT% | 35-45∞C/95-113∞F | Source undefined |
| /C20 | VOL% | Alcohol / Water | 55 - 100 VOL% | 0-40∞C/32-104∞F | Source undefined |
| /C21 | °Brix | Sugar / Water | 40 - 80 °Brix | 10-40∞C/50-104∞F | Source undefined |
| | | | | 75-100∞C/167-212∞F | |

[1)] only with material HC

## Table 11 : Selection table process connection and materials, installation length

| | | | RCCS 30-32 | RCCS 33 | RCCS34 RCCT34 | | RCCS36 RCCT36 | | RCCS38 RCCT38 | | RCCS39 RCCT39 | | RCCS39/IR RCCT39/IR | | RCCS39/XR RCCT39/XR | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | SH | SH | SL | HC | SL | HC | SL | HC | SL | HC | SL | HC | SL | HC |
| Flanges according to ASME B16.5 | 01A1 | ½"-150 | 240 | 240 | 370 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 01A2 | ½"-300 | 240 | 240 | 370 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 01A3 | ½"-600 | 250 | 250 | 380 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 01A4 | ½"-900 | ---- | 270 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 01A5 | ½"-1500 | 270 | ---- | 400 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 02A1 | 1"-150 | 240 | 240 | 370 | 390 | 500 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 02A2 | 1"-300 | 240 | 240 | 370 | 390 | 500 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 02A3 | 1"-600 | 260 | 260 | 390 | ---- | 520 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 02A4 | 1"-900 | ---- | 320 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 02A5 | 1"-1500 | 320 | ---- | 450 | ---- | 540 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 04A1 | 1½"-150 | 250 | 250 | 380 | 390 | 500 | 520 | 600 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 04A2 | 1½"-300 | 250 | 250 | 380 | 390 | 510 | 520 | 600 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 04A3 | 1½"-600 | 270 | 270 | 400 | ---- | 530 | ---- | 620 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 04A4 | 1½"-900 | ---- | 340 | ---- | ---- | ---- | ---- | 640 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 04A5 | 1½"-1500 | 340 | ---- | 470 | ---- | 600 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 05A1 | 2"-150 | ---- | ---- | ---- | ---- | 510 | 520 | 600 | 620 | ---- | ---- | ---- | ---- | ---- | ---- |
| | 05A2 | 2"-300 | ---- | ---- | ---- | ---- | 510 | 520 | 600 | 620 | ---- | ---- | ---- | ---- | ---- | ---- |
| | 05A3 | 2"-600 | ---- | ---- | ---- | ---- | 540 | ---- | 630 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 05A4 | 2"-900 | ---- | ---- | ---- | ---- | ---- | ---- | 720 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 05A5 | 2"-1500 | ---- | ---- | ---- | ---- | 660 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 06A1 | 2½"-150 | ---- | ---- | ---- | ---- | ---- | ---- | 610 | 620 | ---- | ---- | ---- | ---- | ---- | ---- |
| | 06A2 | 2½"-300 | ---- | ---- | ---- | ---- | ---- | ---- | 610 | 620 | ---- | ---- | ---- | ---- | ---- | ---- |
| | 06A3 | 2½"-600 | ---- | ---- | ---- | ---- | ---- | ---- | 640 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 06A4 | 2½"-900 | ---- | ---- | ---- | ---- | ---- | ---- | 760 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 08A1 | 3"-150 | ---- | ---- | ---- | ---- | ---- | ---- | 610 | 620 | 1000 | 1020 | ---- | ---- | ---- | ---- |
| | 08A2 | 3"-300 | ---- | ---- | ---- | ---- | ---- | ---- | 620 | 620 | 1000 | 1020 | ---- | ---- | ---- | ---- |
| | 08A3 | 3"-600 | ---- | ---- | ---- | ---- | ---- | ---- | 640 | ---- | 1000 | ---- | ---- | ---- | ---- | ---- |
| | 08A4 | 3"-900 | ---- | ---- | ---- | ---- | ---- | ---- | 760 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 10A1 | 4"-150 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1000 | 1020 | 1100 | ---- | ---- | ---- |
| | 10A2 | 4"-300 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1000 | 1020 | 1100 | ---- | ---- | ---- |
| | 10A3 | 4"-600 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1030 | ---- | 1100 | ---- | ---- | ---- |
| | 12A1 | 5"-150 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1000 | 1020 | 1100 | 1100 | ---- | ---- |
| | 12A2 | 5"-300 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1000 | 1020 | 1100 | 1100 | ---- | ---- |
| | 12A3 | 5"-600 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1040 | ---- | 1160 | ---- | ---- | ---- |
| | 15A1 | 6"-150 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1100 | 1100 | 1350 | ---- |
| | 15A2 | 6"-300 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1100 | 1100 | 1350 | ---- |
| | 15A3 | 6"-600 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1200 | ---- | ---- | ---- |
| | 20A1 | 8"-150 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1350 | ---- |
| | 20A2 | 8"-300 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1350 | ---- |
| Flanges according to EN 1092-1 | 01D4 | DN 15 PN 40 | 240 | 240 | 370 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 01D6 | DN 15 PN 100 | 250 | 250 | 380 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 02D4 | DN 25 PN 40 | 240 | 240 | 370 | 390 | 500 | 520 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 02D6 | DN 25 PN 100 | 260 | 260 | 390 | ---- | 520 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 04D4 | DN 40 PN 40 | 240 | 240 | 370 | 390 | 500 | 520 | 600 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 04D6 | DN 40 PN 100 | 320 | 320 | 450 | ---- | 560 | ---- | 620 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 05D4 | DN 50 PN 40 | ---- | ---- | ---- | ---- | 500 | 520 | 600 | 620 | ---- | ---- | ---- | ---- | ---- | ---- |
| | 05D5 | DN 50 PN 63 | ---- | ---- | ---- | ---- | 520 | ---- | 620 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 05D6 | DN 50 PN 100 | ---- | ---- | ---- | ---- | 590 | ---- | 660 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 08D4 | DN 80 PN 40 | ---- | ---- | ---- | ---- | ---- | ---- | 610 | 620 | 1000 | 1020 | ---- | ---- | ---- | ---- |
| | 08D5 | DN 80 PN 63 | ---- | ---- | ---- | ---- | ---- | ---- | 620 | ---- | 1000 | ---- | ---- | ---- | ---- | ---- |
| | 08D6 | DN 80 PN 100 | ---- | ---- | ---- | ---- | ---- | ---- | 730 | ---- | 1000 | ---- | ---- | ---- | ---- | ---- |
| | 10D2 | DN 100 PN 16 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1100 | ---- | ---- | ---- |
| | 10D4 | DN 100 PN 40 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1000 | 1020 | 1100 | ---- | ---- | ---- |
| | 10D5 | DN 100 PN 63 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1000 | ---- | 1100 | ---- | ---- | ---- |
| | 10D6 | DN 100 PN 100 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1050 | ---- | 1100 | ---- | ---- | ---- |
| | 12D2 | DN 125 PN 16 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1100 | 1100 | ---- | ---- |
| | 12D4 | DN 125 PN 40 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1000 | 1020 | 1100 | 1100 | ---- | ---- |
| | 12D5 | DN 125 PN 63 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1000 | ---- | 1100 | ---- | ---- | ---- |
| | 12D6 | DN 125 PN 100 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1100 | ---- | 1140 | ---- | ---- | ---- |
| | 15D2 | DN 150 PN 16 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1100 | 1100 | 1350 | ---- |
| | 15D4 | DN 150 PN 40 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1100 | 1100 | 1350 | ---- |
| | 15D5 | DN 150 PN 63 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1140 | ---- | ---- | ---- |
| | 15D6 | DN 150 PN 100 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1180 | ---- | ---- | ---- |
| | 20D2 | DN 200 PN 16 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1350 | ---- |
| | 20D4 | DN 200 PN 40 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1350 | ---- |

## Table 11 : Selection table process connection and materials, installation length (continued)

| | | | RCCS 30-32 | RCCS 33 | RCCS34 RCCT34 | | RCCS36 RCCT36 | | RCCS38 RCCT38 | | RCCS39 RCCT39 | | RCCS39/IR RCCT39/IR | | RCCS39/XR RCCT39/XR | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | SH | SH | SL | HC | SL | HC | SL | HC | SL | HC | SL | HC | SL | HC |
| Flanges according to JIS B 2220 | 01J1 | DN 15 10K | 240 | 240 | 370 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 01J2 | DN 15 20K | 240 | 240 | 370 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 02J1 | DN 25 10K | 240 | 240 | 370 | 390 | 500 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 02J2 | DN 25 20K | 240 | 240 | 370 | 390 | 500 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 04J1 | DN 40 10K | 240 | 240 | 370 | 390 | 500 | 520 | 600 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 04J2 | DN 40 20K | 240 | 240 | 370 | 390 | 500 | 520 | 600 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 05J1 | DN 50 10K | ---- | ---- | ---- | ---- | 500 | 520 | 600 | 620 | ---- | ---- | ---- | ---- | ---- | ---- |
| | 05J2 | DN 50 20K | ---- | ---- | ---- | ---- | 500 | 520 | 600 | 620 | ---- | ---- | ---- | ---- | ---- | ---- |
| | 08J1 | DN 80 10K | ---- | ---- | ---- | ---- | ---- | ---- | 600 | 620 | 1000 | 1020 | ---- | ---- | ---- | ---- |
| | 08J2 | DN 80 20K | ---- | ---- | ---- | ---- | ---- | ---- | 600 | 620 | 1000 | 1020 | ---- | ---- | ---- | ---- |
| | 10J1 | DN 100 10K | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1000 | 1020 | 1100 | ---- | ---- | ---- |
| | 10J2 | DN 100 20K | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1000 | 1020 | 1100 | ---- | ---- | ---- |
| | 12J1 | DN 125 10K | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1000 | 1020 | 1100 | 1100 | ---- | ---- |
| | 12J2 | DN 125 20K | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1000 | 1020 | 1100 | 1100 | ---- | ---- |
| | 15J1 | DN 150 10K | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1100 | 1100 | ---- | ---- |
| | 15J2 | DN 150 20K | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1100 | 1100 | ---- | ---- |
| Clamp DIN | 01S4 | DN 15 | 240 | 240 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 02S4 | DN 25 | 240 | 240 | 370 *) | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 04S4 | DN 40 | 240 | 240 | 370 | ---- | 500 *) | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 05S4 | DN 50 | ---- | ---- | ---- | ---- | 500 | ---- | 600 *) | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 06S4 | DN 65 | ---- | ---- | ---- | ---- | ---- | ---- | 600 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 10S4 | DN 100 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1000 | ---- | ---- | ---- | ---- | ---- |
| Tri-Clamp | 01S8 | ½“ | 240 | 240 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 02S8 | 1“ | 240 | 240 | 370 *) | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 04S8 | 1½“ | 240 | 240 | 370 | ---- | 500 *) | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 05S8 | 2“ | ---- | ---- | ---- | ---- | 500 | ---- | 600 *) | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 08S8 | 3“ | ---- | ---- | ---- | ---- | ---- | ---- | 600 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 10S8 | 4“ | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1000 | ---- | ---- | ---- | ---- | ---- |
| DIN11851 | 02S2 | DN 25 | 240 | 240 | 370 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 04S2 | DN 40 | ---- | ---- | ---- | ---- | 500 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 05S2 | DN 50 | ---- | ---- | ---- | ---- | ---- | ---- | 600 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 10S2 | DN 100 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1000 | ---- | ---- | ---- | ---- | ---- |
| | 41G9 | G¼“ female | 260 | 260 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 01G9 | G½“ female | 260 | 260 | 390 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 23G9 | G¾“ female | 260 | 260 | 390 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 41T9 | NPT¼“ female | 260 | 260 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 01T9 | NPT½“ female | 260 | 260 | 390 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | 23T9 | NPT¾“ female | 260 | 260 | 390 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | | | | | | | | | | | | | |
| | *) not possible with Option SFx, SA, SE | | | | | | | | | | | | | | | |

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