

RT, LABO-RT-S, I, U, F, C, FLEX-RT, OMNI-RT

Турбинные датчики и индикаторы потока

GHM MESSTECHNIK



Технические характеристики

Архангельск (8182)63-90-72	Иваново (4932)77-34-06	Липецк (4742)52-20-81	Пенза (8412)22-31-16	Ставрополь (8652)20-65-13
Астана (7172)727-132	Ижевск (3412)26-03-58	Магнитогорск (3519)55-03-13	Пермь (342)205-81-47	Сургут (3462)77-98-35
Астрахань (8512)99-46-04	Иркутск (395)279-98-46	Москва (495)268-04-70	Ростов-на-Дону (863)308-18-15	Тверь (4822)63-31-35
Барнаул (3852)73-04-60	Казань (843)206-01-48	Мурманск (8152)59-64-93	Рязань (4912)46-61-64	Томск (3822)98-41-53
Белгород (4722)40-23-64	Калининград (4012)72-03-81	Набережные Челны (8552)20-53-41	Самара (846)206-03-16	Тула (4872)74-02-29
Брянск (4832)59-03-52	Калуга (4842)92-23-67	Нижний Новгород (831)429-08-12	Санкт-Петербург (812)309-46-40	Тюмень (3452)66-21-18
Владивосток (423)249-28-31	Кемерово (3842)65-04-62	Новокузнецк (3843)20-46-81	Саратов (845)249-38-78	Ульяновск (8422)24-23-59
Волгоград (844)278-03-48	Киров (8332)68-02-04	Новосибирск (383)227-86-73	Севастополь (8692)22-31-93	Уфа (347)229-48-12
Вологда (8172)26-41-59	Краснодар (861)203-40-90	Омск (3812)21-46-40	Симферополь (3652)67-13-56	Хабаровск (4212)92-98-04
Воронеж (473)204-51-73	Красноярск (391)204-63-61	Орел (4862)44-53-42	Смоленск (4812)29-41-54	Челябинск (351)202-03-61
Екатеринбург (343)384-55-89	Курск (4712)77-13-04	Оренбург (3532)37-68-04	Сочи (862)225-72-31	Череповец (8202)49-02-64

Киргизия (996)312-96-26-47 **Казахстан** (772)734-952-31 **Таджикистан** (992)427-82-92-69

Flow Transmitter RT-...AK



- High precision
- No magnetic components in the flow space
- High pressure resistance

Characteristics

A turbine acts as the primary sensor; its rotational speed is proportional to the flow rate. The rotational speed is detected by means of a biased Hall sensors, i.e. there are no magnets in the flow space.

Technical data

Sensor	biased Hall sensor	
Nominal width	DN 15..50	
Process connection	male thread G 1/2 A...G 2 A	
Metering ranges	1.8..1133 l/min for details, see table "Ranges"	
Measurement accuracy	±1 % of full scale value in the specified metering range, including linearity and repeatability	
Medium temperature	-20..+85 °C optionally -20..+150 °C (for 8 bar min.)	
Ambient temperature	-20..+70 °C	
Storage temperature	-20..+80 °C	
Materials medium-contact	Housing	stainless steel 315
	Turbine	stainless steel 430
	Bearing	tungsten carbide
Material electronics housing	CW614N nickelled	
Max. particle size	0.5 mm	
Pressure loss	0.3 bar at Q _{max} .	
Pressure resistance	PN 250 bar	
Supply voltage	10..30 V DC	
Signal output	transistor output "push-pull" (resistant to short circuits and polarity reversal) I _{out} = 100 mA max.	
Current consumption	20 mA without load	
Max. load current	100 mA	

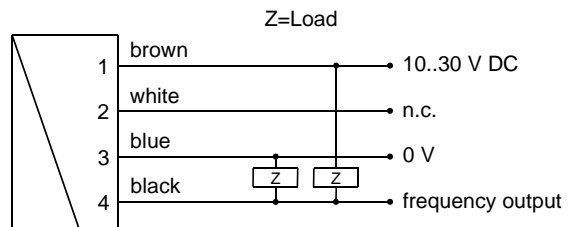
Electrical connection	for round plug connector M12x1, 4-pole
Ingress protection	IP 67
Weight	see table "Dimensions"
Conformity	CE

Ranges

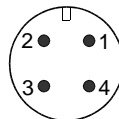
Types	Metering range (1..5 mm ² /s)		Pulses / litre ±10 %
	l/min	m ³ /h	
RT-015AK001.	1.8.. 18	0.11.. 1.1	2900
RT-020AK002.	3.7.. 37	0.22.. 2.2	1700
RT-020AK004.	6.7.. 67	0.40.. 4.0	1100
RT-020AK008.	13.3.. 133	0.80.. 8.0	400
RT-025AK016.	26.7.. 267	1.60.. 16.0	190
RT-040AK034.	56.7.. 567	3.40.. 34.0	60
RT-050AK068.	113.3..1133	6.80.. 68.0	24

Wiring

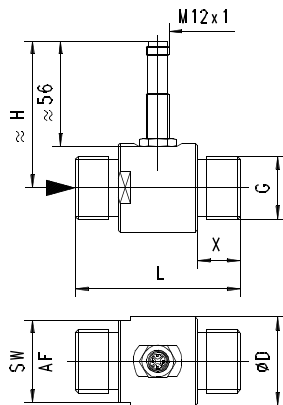
Push-pull output, can be connected to PNP or NPN inputs.



Connection example: PNP NPN



Dimensions



DN	G	ØD	SW / AF	H	L	X	Range m³/h at 1-5 mm²/s	Weight kg
15	1/2	38	35	71	64	19	0.11 – 1.1	0.30
20	3/4	38	35	72	64	19	0.22 – 2.2	0.40
20	3/4	38	35	72	64	19	0.40 – 4.0	0.40
20	3/4	40	38	75	83	22	0.80 – 8.0	0.40
25	1	47	44	78	88	23	1.60 – 16.0	0.60
40	1 1/2	60	52	84	114	28	3.40 – 34.0	1.40
50	2	70	64	89	132	29	6.80 – 68.0	1.90

Handling and Operation

Installation

As with all flow meters, if possible the turbine should be installed ahead of a valve (on the pressure side). Good degassing should be ensured. 10 x D calming sections are recommended before and after the turbine in order to maintain the specified accuracies. The turbine should be filled with fluid at all times. The electronics housing does not project into the flow space.

Ordering code

RT- 1. 2. 3. 4. 5. 6.

 A K T

○=Option

1. Nominal width									
015	DN 15 - G 1/2 A								
020	DN 20 - G 3/4 A								
025	DN 25 - G 1 A								
040	DN 40 - G 1 1/2 A								
050	DN 50 - G 2 A								
2. Mechanical connection									
A	male thread								
3. Housing material									
K	stainless steel								
4. Metering range									
001	0.11.. 1.1 m³/h								●
002	0.22.. 2.2 m³/h								●
004	0.40.. 4.0 m³/h								●
008	0.80.. 8.0 m³/h								●
016	1.60..16.0 m³/h								●
034	3.40..34.0 m³/h								●
068	6.80..68.0 m³/h								●
5. Signal output									
T	electronics								
6. Option									
H	○ high temperature model								

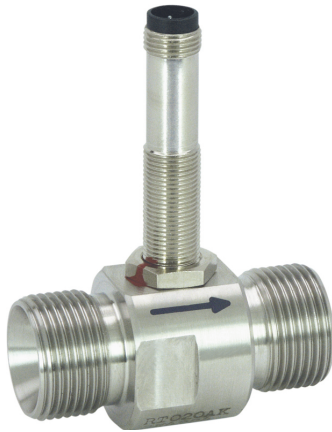
Options

- Flanged model,
- max. temperature 150 °C
- DN 80-300 PN 16
- model for air / gas
- range from 0.05 m³/h

Accessories

- Cable/round plug connector (KB...) see additional information "Accessories"
- Counter EEZ-904
- OMNI-TA

Durchflusstransmitter LABO-RT-I / U / F / C



- Hohe Genauigkeit
- Keine magnetischen Bauteile im Strömungsraum
- Hohe Druckbelastbarkeit
- 0..10 V-, 4..20 mA-, Frequenz-, Pulsausgang komplett konfigurierbar

Merkmale

Als primärer Messwertaufnehmer dient eine Turbine, deren Umdrehungszahl proportional zur fließenden Durchflussmenge ist. Die Umdrehungszahl wird mit Hilfe vorgespannter Hall-Sensoren detektiert, d.h. es befinden sich keine Magnete im Strömungsraum.

Die LABO-RT-Elektronik stellt unterschiedliche Ausgangssignale zur Verfügung:

- Analogsignal 0/4...20 mA (LABO-RT-I)
- Analogsignal 0/2..10 V (LABO-RT-U)
- Frequenzsignal (LABO-RT-F) oder
- Mengensignal Puls / x Liter (LABO-RT-C)

Eine Ausführung mit Schaltausgang ist ebenfalls verfügbar (siehe gesondertes Datenblatt).

Der Bereichsendwert kann auf Wunsch über "Teach-In" bei jeweils anstehender Strömung eingestellt werden.

Technische Daten

Sensor	Turbine mit vorgespanntem Hall-Sensor
Nennweite	DN 15..50 (andere auf Anfrage)
Anschlussart	G 1/2 A...G 2 A
Messbereiche	siehe Tabelle „Bereiche“
Messunsicherheit	±1 % vom Endwert im spezifizierten Messbereich inklusive Linearität und Wiederholgenauigkeit
Druckverlust	0,3 bar bei Q_{max}
Druckfestigkeit	PN 250 bar
Medientemperatur	-20..+85 °C optional -20..+150 °C (bei mind. 8 bar)
Umgebungs-temperatur	-20..+70 °C
Lagertemperatur	-20..+80 °C

HONSBERG

Member of GHM GROUP

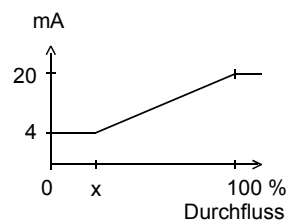
LABO-RT-I / U / F / C

Werkstoffe medienberührt	Gehäuse Turbine Lager	Edelstahl 315 Edelstahl 430 Wolframkarbid
Werkstoff Elektronikgehäuse	CW614N vernickelt	
Max. Partikelgröße	0,5 mm	
Versorgungsspannung	10..30 V DC bei Spannungsausgang 10 V: 15..30 V DC	
Leistungsaufnahme	< 1 W (bei unbelasteten Ausgängen)	
Ausgangsdaten	alle Ausgänge sind kurzschlussfest und verpolungssicher	
Stromausgang:	4..20 mA (0..20 mA auf Anfrage)	
Spannungsausgang:	0..10 V (2..10 V auf Anfrage) Ausgangsstrom max. 20 mA	
Frequenzausgang:	Transistorausgang "Push-Pull" $I_{out} = 100$ mA max.	
Pulsausgang:	Transistorausgang "Push-Pull" $I_{out} = 100$ mA max. Pulsbreite 50 ms Puls/Menge ist bei der Bestellung anzugeben	
Anzeige	gelbe LED zeigt Betriebsspannung (LABO-RT-I / U) oder Ausgangszustand (LABO-RT-F / C) (schnelles Blinken = Programmierung)	
Elektr.-Anschluss	für Rundsteckverbinder M12x1, 4-polig	
Schutzart	IP 67	
Gewicht	siehe Tabelle unter „Abmessungen“	
Konformität	CE	

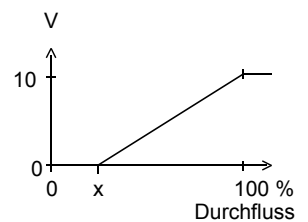
Signalausgangskennlinien

Wert x = Anfang des spezifizierten Messbereichs

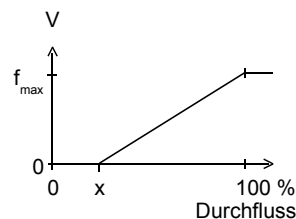
Stromausgang



Spannungsausgang



Frequenzausgang

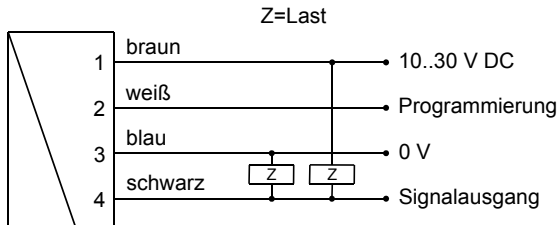


f_{max} wählbar im Bereich bis zu 2000 Hz Andere Kennlinien auf Anfrage

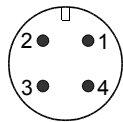
Bereiche

Type	Messbereich (1..5 mm ² /s)	
	l/min	m ³ /h
RT-015AK001.	1,8.. 18	0,11.. 1,1
RT-020AK002.	3,7.. 37	0,22.. 2,2
RT-020AK004.	6,7.. 67	0,40.. 4,0
RT-020AK008.	13,3.. 133	0,80.. 8,0
RT-025AK016.	26,7.. 267	1,60..16,0
RT-040AK034.	56,7.. 567	3,40..34,0
RT-050AK068.	113,3..1133	6,80..68,0

Anschlussbild

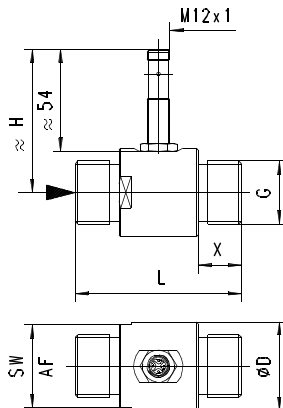


Anschlussbeispiel: PNP NPN



Vor der Elektroinstallation ist darauf zu achten, dass die Versorgungsspannung den Datenangaben entspricht. Es wird empfohlen, abgeschirmtes Kabel zu verwenden. Der Gegentakt-Schaltausgang (Push-Pull-Ausgang) der Frequenz- oder Pulsausgangsversion kann wahlfrei wie ein PNP- oder wie ein NPN-Ausgang beschaltet werden.

Abmessungen



DN	G	ØD	SW / AF	H	L	X	Bereich m ³ / h bei 1-5 mm ² / s	Gewicht kg
15	1/2	38	35	69	64	19	0,11 – 1,1	0,32
20	3/4	38	35	70	64	19	0,22 – 2,2	0,42
20	3/4	38	35	70	64	19	0,40 – 4,0	0,42
20	3/4	40	38	73	83	22	0,80 – 8,0	0,42
25	1	47	44	76	88	23	1,60 – 16,0	0,63
40	1 1/2	60	52	82	114	28	3,40 – 34,0	1,42
50	2	70	64	87	132	29	6,80 – 68,0	1,92

HONSBERG

Member of GHM GROUP

LABO-RT-I / U / F / C

Handhabung und Betrieb

Montage

Die Turbine sollte wie alle Durchflussmesser vor einem eventuellen Ventil (auf die Druckseite) eingebaut werden. Auf gute Entlüftung ist zu achten. 10 x D Beruhigungsstrecken werden vor und hinter der Turbine empfohlen, um die genannten Genauigkeiten zu erhalten. Die Turbine sollte ständig mit Flüssigkeit gefüllt sein. Das Elektronikgehäuse ragt nicht in den Strömungsraum.

Hinweise

Der Messbereichsendwert kann vom Benutzer per Teach-In programmiert werden. Die Programmierbarkeit muss bei der Bestellung angegeben werden, anderenfalls ist das Gerät nicht programmierbar.

Als komfortable Programmiermöglichkeit per PC für alle Parameter und zur Justierung steht der Gerätekonfigurator ECI-1 mit zugehöriger Software zur Verfügung.

Bei der Pulsausgangsversion steht die Teach-In-Funktion nicht zur Verfügung.

Bedienung und Programmierung

Der Teach-In-Vorgang kann vom Benutzer wie folgt durchgeführt werden:

- Gerät mit dem einzustellenden Durchflusswert beaufschlagen
- Impuls von mindestens 0,5 Sekunden und max. 2 Sekunden Dauer an Pin 2 anlegen (z.B. durch Brücke zur Versorgungsspannung oder Puls von SPS), um den gemessenen Wert zu übernehmen.
- Nach erfolgtem Teach-In sollte Pin 2 mit 0 V verbunden werden, um versehentliche Programmierung zu verhindern.

Die Geräte besitzen eine gelbe LED, die während des Programmierpulses blinkt. Im Betrieb dient die LED als Betriebsspannungsanzeige (bei Analogausgang) oder als Schaltzustandsanzeige (bei Frequenz- oder Pulsausgang).

Um zu vermeiden, dass für das Teach-In ein unerwünschter Betriebszustand angefahren werden muss, kann das Gerät ab Werk mit einem Teach-Offset versehen werden. Der Teach-Offset-Wert wird vor dem Abspeichern zum aktuellen Messwert addiert. Der Offset-Wert kann positiv oder negativ sein.

Beispiel: Das Messbereichsende soll auf 80 % eingestellt werden. Problemlos sind aber nur 60 % zu erreichen. In diesem Fall würde das Gerät mit einem Teach-Offset von +20 % bestellt werden. Bei 60 % im Prozess würde dann beim Teach ein Wert von 80 % gespeichert werden.

Eine weit größere Anzahl von Parametern können auch über den Gerätekonfigurator ECI-1 programmiert werden, falls erforderlich.

Bestellschlüssel

Bestellt wird das Grundgerät z.B. RT-xxx mit Auswertelektronik z.B. LABO-RT-xxxx

RT - 1. 2. 3. 4. 5. **A** **K** **E**

LABO - RT- 6. 7. 8. 9. **S**

○ = Option

1. Nennweite	
015	DN 15 - G 1/2 A
020	DN 20 - G 3/4 A
025	DN 25 - G 1 A
040	DN 40 - G 1 1/2 A
050	DN 50 - G 2 A
2. Mechanischer Anschluss	
A	Außengewinde
3. Gehäusewerkstoff	
K	Edelstahl
4. Messbereich	
001	0,11.. 1,1 m³/h
002	0,22.. 2,2 m³/h
004	0,40.. 4,0 m³/h
008	0,80.. 8,0 m³/h
016	1,60..16,0 m³/h
034	3,40..34,0 m³/h
068	6,80..68,0 m³/h
5. Anschluss für	
E	Auswertelektronik
6. Signalausgang	
I	Stromausgang 4..20 mA
U	Spannungsausgang 0..10 V
F	Frequenzausgang (siehe „Bestellangaben“)
C	Pulsausgang (siehe „Bestellangaben“)
7. Programmierung	
N	Nicht programmierbar (kein Teach-In)
P	○ Programmierbar (Teach-In möglich)
8. Elektrischer Anschluss	
S	Für Rundsteckverbinder M12x1, 4-polig
9. Optional	
H	○ 100 °C Version (mit 300 mm Kabel)

HONSBERG

Member of GHM GROUP

LABO-RT-I / U / F / C

Notwendige Bestellangaben

Für LABO-RT-F:

Ausgangsfrequenz bei Vollausschlag Hz
Maximalwert: 2000 Hz

Für LABO-RT-C:

Für die Pulsausgangsversion muss das Volumen angegeben werden (mit Zahlenwert und Einheit), das einem Puls entsprechen soll.

Volumen pro Puls (Zahlenwert)

Volumen pro Puls (Einheit)

Optionen für LABO

Sonderbereich Analogausgang:

<= Messbereich (Standard=Messbereich) l/min

Sonderbereich Frequenzausgang:

<= Messbereich (Standard=Messbereich) l/min

Power-On-Delay-Zeit (0..99 s)

(Zeit nach Anlegen der Versorgung, während der die Ausgänge nicht betätigt bzw. auf definierte Werte gelegt werden) s

Weitere Optionen auf Anfrage.

Optionen

- Flanschausführung
- Temperatur max.150 °C
- DN 80-300 PN 16
- Ausführung für Luft / Gas
- Bereich ab 0,05 m³/h

Zubehör

- Kabel / Rundsteckverbinder (KB...)
Weitere Informationen erhalten Sie im Hauptverzeichnis „Zubehör“
- Auswertelektronik OMNI-TA
- Gerätekonfigurator ECI-1

Flow Switch LABO-RT-S



- Very short response time
- High precision
- No magnetic components in the flow space
- High pressure resistance

Characteristics

A turbine acts as the primary sensor; its rotational speed is proportional to the flow rate. The rotational speed is detected by means of pre-tensioned Hall sensors, i.e. there are no magnets in the flow space.

The integrated converter / counter make available an electronic switching output (push-pull) with adjustable characteristics (minimum/maximum) and hysteresis, which responds when an adjustable limit is fallen short of or exceeded.

The switching value can be set to the currently existing flow using "teaching".

Models with analog or pulse output are also available.

Technical data

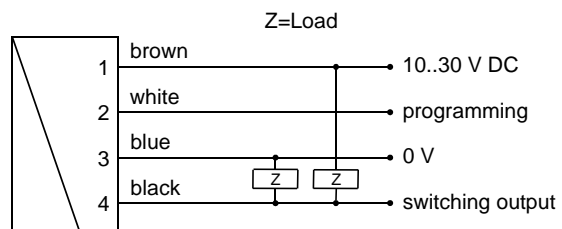
Sensor	turbine with biased Hall sensor	
Nominal width	DN 15..50	
Process connection	G 1/2 A...G 2 A (others on request)	
Switching ranges	see table "Ranges"	
Measurement accuracy	±1 % of full scale value in the specified metering range including linearity and repeatability	
Pressure loss	0.3 bar at Q_{max} .	
Pressure resistance	PN 250 bar	
Medium temperature	-20..+85 °C optionally -20..+150 °C (for 8 bar min.)	
Ambient temperature	-20..+70 °C	
Storage temp.	-20..+80 °C	
Materials medium-contact	Housing	stainless steel 315
	Turbine	stainless steel 430
	Bearing	tungsten carbide
Material electronics housing	CW614N plated	
Max. particle size	0.5 mm	

Supply voltage	10..30 V DC
Power consumption	< 1 W (without load)
Switching output	transistor output "push-pull" (resistant to short circuits and polarity reversal) $I_{out} = 100$ mA max.
Display	yellow LED (On = Normal / Off = Alarm / rapid flashing = Programming)
Electrical connection	for round plug connector M12x1, 4-pole
Ingress protection	IP 67
Weight	see table "Dimensions"
Conformity	CE

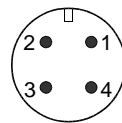
Ranges

Types	Switching range (1..5 mm ² /s)	
	l/min	m ³ /h
RT-015AK001.	1.8.. 18	0.11.. 1.1
RT-020AK002.	3.7.. 37	0.22.. 2.2
RT-020AK004.	6.7.. 67	0.40.. 4.0
RT-020AK008.	13.3.. 133	0.80.. 8.0
RT-025AK016.	26.7.. 267	1.60.. 16.0
RT-040AK034.	56.7.. 567	3.40.. 34.0
RT-050AK068.	113.3..1133	6.80.. 68.0

Wiring



Connection example: PNP NPN

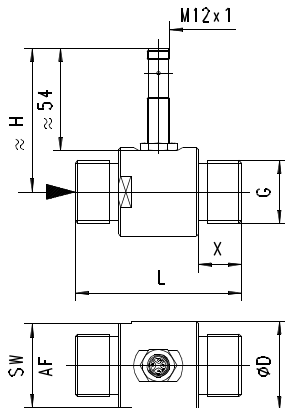


Before the electrical installation, it must be ensured that the supply voltage corresponds to the data sheet.

It is recommended to use shielded wiring.

The push-pull output) can as desired be switched as a PNP or an NPN output.

Dimensions



DN	G	ØD	SW / AF	H	L	X	Range m ³ /h at 1-5 mm ² /s	Weight kg
15	1/2	38	35	69	64	19	0.11 – 1.1	0.32
20	3/4	38	35	70	64	19	0.22 – 2.2	0.42
20	3/4	38	35	70	64	19	0.40 – 4.0	0.42
20	3/4	40	38	73	83	22	0.80 – 8.0	0.42
25	1	47	44	76	88	23	1.60 – 16.0	0.63
40	1 1/2	60	52	82	114	28	3.40 – 34.0	1.42
50	2	70	64	87	132	29	6.80 – 68.0	1.92

Handling and operation

Installation

As with all flow meters, if possible the turbine should be installed ahead of a valve (on the pressure side). Good degassing should be ensured. 10 x D calming sections are recommended before and after the turbine in order to maintain the specified accuracies. The turbine should be filled with fluid at all times. The electronics housing does not project into the flow space.

Note

The switching value can be programmed by the user via "teaching". If desired, programmability can be blocked by the manufacturer.

The ECI-1 device configurator with associated software is available as a convenient option for programming all parameters by PC, and for adjustment.

Operation and programming

The switching value is set as follows:

- Apply the flow rate to be set to the device.
- Apply an impulse of at least 0.5 seconds and max. 2 seconds duration to pin 2 (e.g. via a bridge to the supply voltage or a pulse from the PLC), in order to accept the measured value.
- When the teaching is complete, pin 2 should be connected to 0 V, so as to prevent unintended programming.

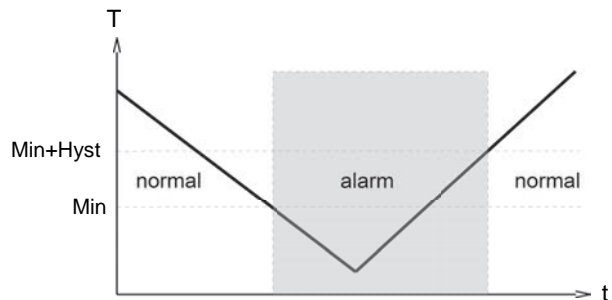
The device has a yellow LED which flashes during the programming pulse. During operation, the LED serves as a status display for the switching output.

In order to avoid the need to transit to an undesired operating status during the teach-in, the device can be provided ex-works with a teach-offset. The teach-offset point is added to the currently measured value before saving. The offset point can be positive or negative.

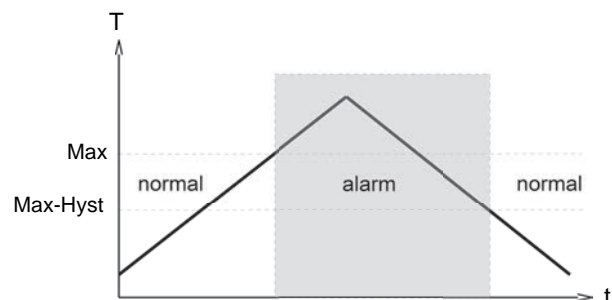
Example: The switching value should be set to 80 l/min. However, it is possible only to reach 60 l/min without problems. In this case, the device would be set using a teach-offset of +20 l/min. At a flow rate of 60 l/min in the process, teaching would then store a value of 80 l/min.

The limit switch can be used to monitor minimal or maximal.

With a minimum-switch, falling below the limit value causes a switchover to the alarm state. Return to the normal state occurs when the limit value plus the set hysteresis is once more exceeded.

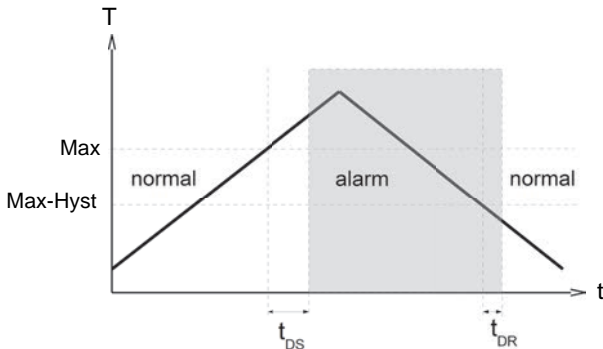


With a maximum-switch, exceeding the limit value causes a switchover to the alarm state. Return to the normal state occurs when the measured value once more falls below the limit value minus the set hysteresis.



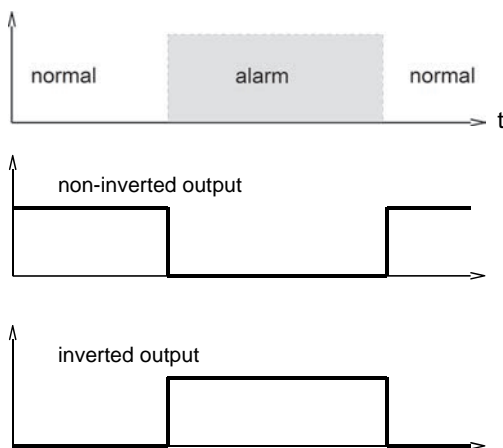
Product Information

A changeover delay time (t_{DS}) can be applied to switching to the alarm state. Equally, one switch-back delay time (t_{DR}) of several can be applied to switching back to the normal state.



In the normal state the integrated LED is on, in the alarm state it is off, and this corresponds to its status when there is no supply voltage.

In the non-inverted (standard) model, while in the normal state the switching output is at the level of the supply voltage; in the alarm state it is at 0 V, so that a wire break would also display as an alarm state at the signal receiver. Optionally, an inverted switching output can also be provided, i.e. in the normal state the output is at 0 V, and in the alarm state it is at the level of the supply voltage.



A Power-On-Delay function (ordered as a separate option) makes it possible to maintain the switching output in the normal state for a defined period after application of the supply voltage.

Ordering code

The basic device is ordered e.g. RT-xxx with electronics e.g. LABO-RT-xxx

RT - 1. 2. 3. 4. 5. **A** **K** **E**

LABO - RT- 6. 7. 8. 9. 10. 11. **S** **S**

○ = Option

1. Nominal width	
015	DN 15 - G 1/2 A
020	DN 20 - G 3/4 A
025	DN 25 - G 1 A
040	DN 40 - G 1 1/2 A
050	DN 50 - G 2 A
2. Mechanical connection	
A	male thread
3. Housing material	
K	stainless steel
4. Metering range	
001	0.11.. 1.1 m³/h
002	0.22.. 2.2 m³/h
004	0.40.. 4.0 m³/h
008	0.80.. 8.0 m³/h
016	1.60..16.0 m³/h
034	3.40..34.0 m³/h
068	6.80..68.0 m³/h
5. Connection for	
E	electronics
6. Switching output (Limit switch)	
S	push-pull (compatible with PNP and NPN)
7. Programming	
P	programmable (teaching possible)
N	○ cannot be programmed (no teaching)
8. Switching function	
L	minimum-switch
H	maximum-switch
9. Switching signal	
O	standard
I	○ inverted
10. Electrical connection	
S	for round plug connector M12x1, 4-pole
11. Optional	
H	○ 100 °C version (with 300 mm cable)

Product Information

Sensors and Instrumentation

Options for LABO

Switching delay period (0.0..99.9 s)
(from Normal to Alarm) . s

Switch-back delay period (0.0..99.9 s)
(from Alarm to Normal) . s

Power-On-Delay period (0..99 s)
(after connecting the supply, time during
which the switching output is not actuated) s

Switching output fixed at l/min

Switching hysteresis %
standard = 2 % of the metering range

Teach-offset %
(in percent of the metering range)
Standard = 0 %

Further options available on request.

Options

- Flanged model,
- max. temperature 150 °C
- DN 80-300 PN 16
- model for air / gas
- range from 0.05 m³/h

Accessories

- Cable/round plug connector (KB...)
see additional information "Accessories"
- Device configurator ECI-1
- OMNI-TA

Flow Transmitter / Switch FLEX-RT



- Versatile turbine flow sensor
- Switching output and analog output (4..20 mA / 0..10 V)
- Top quality materials
- Designed for industrial use
- Ingress protection IP 67
- Infinitely adjustably rotatable cable outlet for clean alignment
- Small, compact construction
- Very simple installation

Characteristics

A turbine acts as the primary sensor; its rotational speed is proportional to the flow rate. The rotational speed is detected by means of a biased Hall sensors, i.e. there are no magnets in the flow space.

The FLEX transducer located on the sensor has an analog output (4..20 mA or 0..10 V) and a switching output, which can be configured as a limit switch for monitoring minimal or maximal, or as a frequency output.

The switching output is designed as a push-pull driver, and can therefore be used both as a PNP or an NPN output. The state of the switching output is signalled with a yellow LED in the switching outlet; the LED has all-round visibility.

The sensor is configured in the factory, or alternatively this can be done with the aid of the optionally available ECI-1 device configurator (USB interface for PC). A selectable parameter can be modified on the device, with the aid of the magnet clip provided. In this case, the current measured value is saved as the parameter value. Examples of these parameters are the switching value or the metering range end value.

The stainless steel electronics housing is rotatable, so it is possible to orient the cable outlet after installation.

HONSBERG

Member of GHM GROUP

FLEX-RT

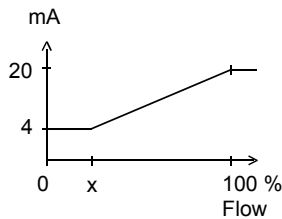
Technical data

Sensor	turbine with biased Hall sensor	
Nominal width	DN 15..50 (others on request)	
Process connection	G 1/2A...G 2 A	
Metering ranges	see table "Ranges"	
Measurement accuracy	±1 % of full scale value in the specified metering range including linearity and repeatability	
Medium temperature	-20..+85 °C optionally -20..+150 °C (for 8 bar min.)	
Ambient temperature	-20..+70 °C	
Storage temperature	-20..+80 °C	
Materials medium-contact	Housing	stainless steel 316
	Turbine	stainless steel 430
	Bearing	tungsten carbide
Material electronics housing	stainless steel 1.4305 adapter CW614N plated	
Max. particle size	0.5 mm	
Pressure loss (average)	0.3 bar at Q _{max}	
Pressure	PN 250 bar	
Supply voltage	18..30 V DC	
Power consumption	<1 W	
Analog output	4..20 mA / load 500 Ohm max. or 0..10 V / load min. 1 kOhm	
Switching output	transistor output "push-pull" (resistant to short circuits and polarity reversal) I _{out} = 100 mA max.	
Switching hysteresis	adjustable (please state when ordering) Standard setting: 2 % F.S., for Min-switch, position of the hysteresis above the limit value, and for Max-switch, below the limit value	
Display	yellow LED (On = Normal / Off = Alarm)	
Electrical connection	for round plug connector M12x1, 4-pole	
Ingress protection	IP 67	
Weight	see table in "Dimensions"	
Conformity	CE	

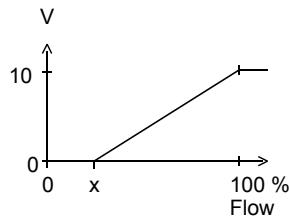
Signal output curves

Value x = Begin of the specified range

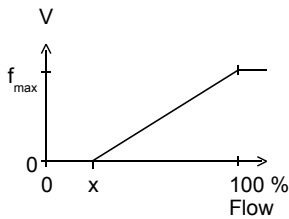
Current output



Voltage output



Frequency output



f_{max} selectable in the range of up to 2000 Hz

Other characters on request.

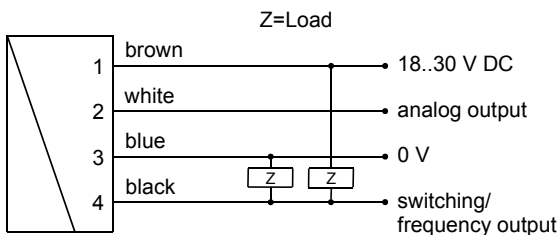
Ranges

Types	Metering range (1.5 mm ² /s)	
	l/min	m ³ /h
RT-015AK001.	1.8.. 18	0.11.. 1.1
RT-020AK002.	3.7.. 37	0.22.. 2.2
RT-020AK004.	6.7.. 67	0.40.. 4.0
RT-020AK008.	13.3.. 133	0.80.. 8.0
RT-025AK016.	26.7.. 267	1.60.. 16.0
RT-040AK034.	56.7.. 567	3.40.. 34.0
RT-050AK068.	113.3.. 1133	6.80.. 68.0

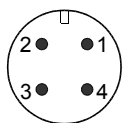
Wiring

Before the electrical installation, it must be ensured that the supply voltage corresponds with the data sheet.

It is recommended to use shielded wiring.



Connection example: PNP NPN

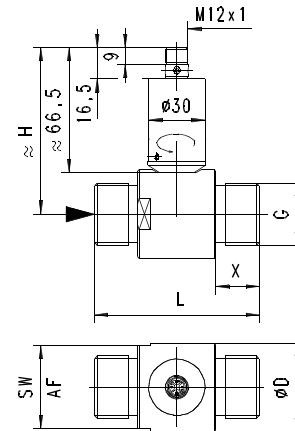


HONSBERG

Member of GHM GROUP

FLEX-RT

Dimensions



DN	G	ØD	SW / AF	H	L	X	Range m ³ /h at 1-5 mm ² /s	Weight kg
15	1/2	38	35	81.5	64	19	0.11 – 1.1	0.44
20	3/4	38	35	82.5	64	19	0.22 – 2.2	0.54
20	3/4	38	35	82.5	64	19	0.40 – 4.0	0.54
20	3/4	40	38	85.5	83	22	0.80 – 8.0	0.54
25	1	47	44	88.5	88	23	1.60 – 16.0	0.74
40	1 1/2	60	52	94.5	114	28	3.40 – 34.0	1.54
50	2	70	64	99.5	132	29	6.80 – 68.0	2.04

Handling and operation

Installation

As with all flow meters, if possible the turbine should be installed ahead of a valve (on the pressure side). Good degassing should be ensured. 10 x D calming sections are recommended before and after the turbine in order to maintain the specified accuracies. The turbine should be filled with fluid at all times.

The electronics housing does not project into the flow space.

Programming

The electronics contain a magnetic contact, with the aid of which different parameters can be programmed. Programming takes place when a magnet clip is applied for a period between 0.5 and 2 seconds to the marking located on the label. If the contact time is longer or shorter than this, no programming takes place (protection against external magnetic fields).



After the programming ("teaching"), the clip can either be left on the device, or removed to protect data.

The device has a yellow LED which flashes during the programming pulse. During operation, the LED serves as a status display for the switching output.

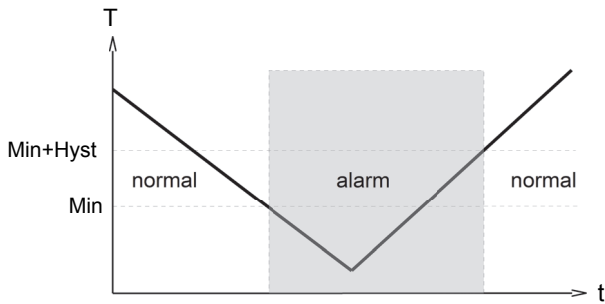
In order to avoid the need to transit to an undesired operating status during "teaching", the device can be provided ex-works with a "teach-offset". The "teach-offset" value is added to the currently measured value before saving (or is subtracted if a negative value is entered).

Example: The switching value is to be set to 70 % of the metering range, because at this flow rate a critical process status is to be notified. However, only 50% can be achieved without danger. In this case, the device would be ordered with a "teach-offset" of +20 %. At 50 % in the process, a switching value of 70 % would then be stored during "teaching".

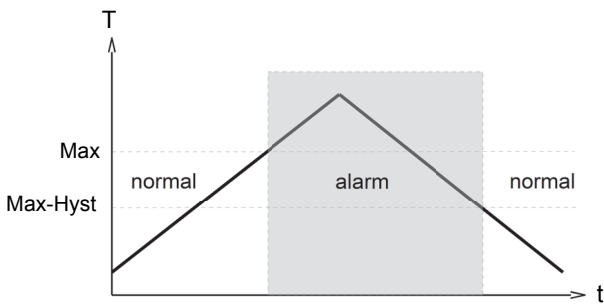
Normally, programming is used to set the limit switch. However, if desired, other parameters such as the end value of the analog or frequency output may also be set.

The limit switch can be used to monitor minimal or maximal.

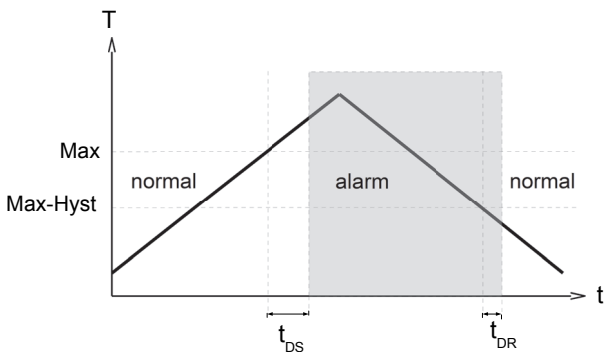
With a minimum-switch, falling below the limit value causes a switchover to the alarm state. Return to the normal state occurs when the limit value plus the set hysteresis is again exceeded.



With a maximum-switch, exceeding the limit value causes a switchover to the alarm state. Return to the normal state occurs when the measured value once more falls below the limit value minus the set hysteresis.



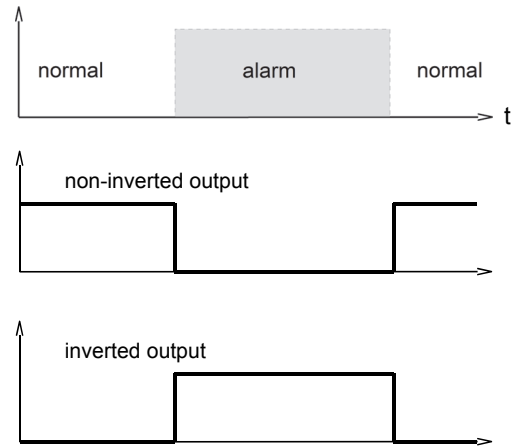
A switchover delay time (t_{DS}) can be applied to the switchover to the alarm state. Equally, one switch-back delay time (t_{DR}) of several can be applied to switching back to the normal state.



In the normal state the integrated LED is on, in the alarm state it is off, and this corresponds to its status when there is no supply volta-

ge.

In the non-inverted (standard) model, while in the normal state the switching output is at the level of the supply voltage; in the alarm state it is at 0 V, so that a wire break would also display as an alarm state at the signal receiver. Optionally, an inverted switching output can also be provided, i.e. in the normal state the output is at 0 V, and in the alarm state it is at the level of the supply voltage.



A Power-On delay function (ordered as a separate option) makes it possible to maintain the switching output in the normal state for a defined period after application of the supply voltage.

Ordering code

The base device RT-XXX is ordered with FLEX-RT-XXX electronics.

RT- 1. 2. 3. 4. 5. 5

FLEX-RT- 6. 7. 8. 9. 10.

○=Option

1. Nominal width	
015	DN 15 - G 1/2 A
020	DN 20 - G 3/4 A
025	DN 25 - G 1 A
040	DN 40 - G 1 1/2 A
050	DN 50 - G 2 A
2. Mechanical connection	
A	male thread
3. Housing material	
K	stainless steel
4. Metering range	
001	0.11.. 1.1 m³/h
002	0.22.. 2.2 m³/h
004	0.40.. 4.0 m³/h
008	0.80.. 8.0 m³/h
016	1.60..16.0 m³/h
034	3.40..34.0 m³/h
068	6.80..68.0 m³/h
5. Connection for	
E	electronics
6. For nominal width	
015	DN 15 - G 1/2 A
020	DN 20 - G 3/4 A
025	DN 25 - G 1 A
040	DN 40 - G 1 1/2 A
050	DN 50 - G 2 A
7. Analog output	
I	current output 4..20 mA
U	voltage output 0..10 V
8. Switching function	
L	minimum-switch
H	maximum-switch
9. Switching signal	
O	standard
I	<input type="radio"/> inverted
10. Option	
H	<input type="radio"/> 150 °C Version (with spacer)

HONSBERG

Member of GHM GROUP

FLEX-RT

Options for FLEX

Special range for analog output: /min
(not greater than the sensor's working range)

Special range for frequency output: /min
(not greater than the sensor's working range)

End frequency (max. 2000 Hz) Hz

Switching delay s
(from Normal to Alarm)

Switchback delay s
(from Alarm to Normal)

Power-On delay (0..99 s) s
(time after power on, during which the outputs are not actuated)

Switching output fixed /min

Special hysteresis (standard = 2 % EW) %

Gooseneck
(recommended at operating temperatures above 70 °C)

If the field is not completed, the standard setting is selected automatically.

Options

- Flanged model,
- max. temperature 150 °C
- DN 80-300 PN 16
- model for air / gas
- range from 0.05 m³/h

Accessories

- Cable/round plug connector (KB...) see additional information "Accessories"
- Device configurator ECI-1

Flow Transmitter / Switch OMNI-RT



- Universal turbine flow sensor
- Analog output, two switching outputs
- Clear, easily legible, illuminated LCD display
- Modifiable units in the display
- Designed for industrial use
- Small, compact construction
- Simple installation

Characteristics

A turbine acts as the primary sensor; its rotational speed is proportional to the flow rate. The rotational speed is detected by means of pre-tensioned Hall sensors, i.e. there are no magnets in the flow space.

The OMNI transducer located on the sensor has a backlit graphics LCD display which is very easy to read, both in the dark and in bright sunlight. The graphics display allows the presentation of measured values and parameters in a clearly understandable form. The measured values are displayed to 4 places, together with their physical unit, which may also be modified by the user. The electronics have an analog output (4..20 mA or 0..10 V) and two switching outputs, which can be used as limit switches for monitoring minimal or maximal, or as two-point controllers.

The switching outputs are designed as push-pull drivers, and can therefore be used both as PNP and NPN outputs. Exceeding limit values is signalled by a red LED which is visible over a long distance, and by a cleartext in the display. The stainless steel case has a hardened non-scratch mineral glass pane. It is operated by a programming ring fitted with a magnet, so there is no need to open the operating controls housing, and its leakproofness is permanently ensured.

By turning the ring to right or left, it is simple to modify the parameters (e.g. switching point, hysteresis...). To protect from unintended programming, it can be removed, turned through 180° and replaced, or completely removed, thus acting as a key.



OPTION C:

Preset Counter with external reset option, complementary switching outputs and actual value display.

OPTION C1:

Instantaneous value display with analogue output, pulse-volume output and totalizer


Technical data

Sensor	turbine with pre-tensioned Hall sensor	
Nominal width	DN 15..50	
Process connection	G 1/2 A...G 2 A	
Metering ranges	see table "Ranges"	
Measurement accuracy	±1 % of full scale value in the specified metering range including linearity and repeatability	
Medium temperature	-20..+85 °C optionally -20..+150 °C (for 8 bar min.)	
Ambient temperature	-20..+70 °C	
Storage temperature	-20..+80 °C	
Max. particle size	0.5 mm	
Pressure loss	maximum 0.3 bar at Q _{max} .	
Pressure	PN 250 bar	
Materials medium-contact	Housing	stainless steel 316
	Turbine	stainless steel 430
	Bearing	tungsten carbide
Materials Electronic housing	Housing	stainless steel 1.4305
	Glass	mineral glass hardened
	Magnet	samarium-Cobalt
	Ring	POM
Supply voltage	18..30 V DC	
Power consumption	< 1 W	
Analog output	4..20 mA / max. load 500 Ω or 0..10 V / min. load 1 kΩ	
Switching outputs	transistor output "push-pull" (resistant to short circuits and polarity reversal) I _{out} = 100 mA max.	
Hysteresis	adjustable, position of the hysteresis depends on minimum or maximum	
Display	backlit graphical LCD-Display (transreflective), extended temperature range -20..+70 °C, 32 x 16 pixels, background illumination, displays value and unit, flashing LED signal lamp with simultaneous message on the display.	
Electrical connection	for round plug connector M12x1, 5-pole	
Ingress protection	IP 67 / (IP 68 when oil-filled)	
Weight	see table "Dimensions"	
Conformity	CE	

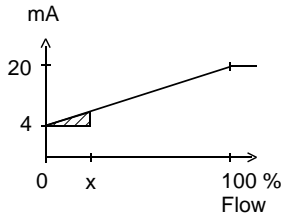
Product Information

Sensors and Instrumentation

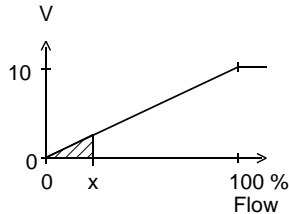
Signal output curves

Value x = Begin of the specified range
 = not specified range

Current output



Voltage output

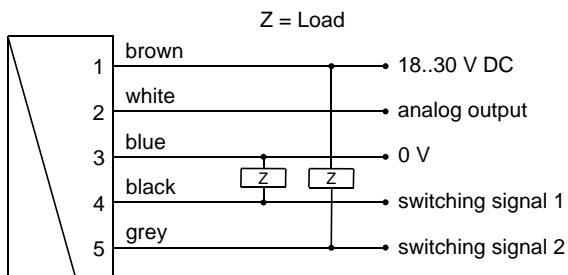


Other characters on request.

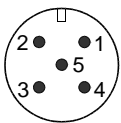
Ranges

Types	Metering range (1..5 mm ² /s)	
	l/min	m ³ /h
OMNI-RT-015AK001.	1.8.. 18	0.11.. 1.1
OMNI-RT-020AK002.	3.7.. 37	0.22.. 2.2
OMNI-RT-020AK004.	6.7.. 67	0.40.. 4.0
OMNI-RT-020AK008.	13.3.. 133	0.80.. 8.0
OMNI-RT-025AK016.	26.7.. 267	1.60..16.0
OMNI-RT-040AK034.	56.7.. 567	3.40..34.0
OMNI-RT-050AK068.	113.3..1133	6.80..68.0

Wiring



Connection example: PNP NPN

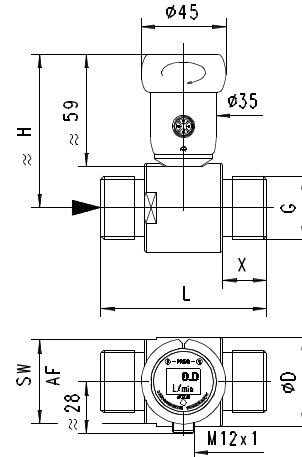


connector M12x1

See separate wiring at C and C1 option in the separate descriptions.

Before the electrical installation, it must be ensured that the supply voltage corresponds to the data sheet.
 The use of shielded cabling is recommended.

Dimensions



G	DN	ØD	SW / AF	H	L	X	Range m ³ /h at 1-5 mm ² /s	Weight
G 1/2	15	38	35	74	64	19	0.11 – 1.1	0.50
G 3/4	20	38	35	75	64	19	0.22 – 2.2	0.60
G 3/4	20	38	35	75	64	19	0.40 – 4.0	0.60
G 3/4	20	40	38	78	83	22	0.80 – 8.0	0.60
G 1	25	47	44	81	88	23	1.60 – 16.0	0.80
G 1 1/2	40	60	52	87	114	28	3.40 – 34.0	1.60
G 2	50	70	64	92	132	29	6.80 – 68.0	2.10

Gooseneck option



A gooseneck (optional) between the electronics head and the primary sensor provides freedom in the orientation of the sensor. This option simultaneously provides thermal decoupling between the two units.

Handling and operation

Installation

As with all flow meters, if possible the turbine should be installed ahead of a valve (on the pressure side). Good degassing should be ensured. 10 X D calming sections are recommended before and after the turbine in order to maintain the specified accuracies. The turbine should be filled with fluid at all times.

It should be ensured that the flow meter and the OMNI electronics are matched to each other.

The electronics housing is permanently connected to the primary sensor, and cannot be removed by the user. After installation, the electronic head can be turned to the best position for reading.

Product Information

Sensors and Instrumentation

Programming

The annular gap of the programming ring can be turned to positions 1 and 2. The following actions are possible:



Set to 1 = continue (STEP)
Set to 2 = modify (PROG)

Neutral position between
1 and 2

The ring can be removed to act as a key, or turned through 180° and replaced to create a programming protector. Operation is by dialog with the display messages, which makes its use very simple.

Starting from the normal display (present value and unit), if 1 (STEP) is repeatedly selected, then the display shows the following information in this order:

Display of the parameters, using position 1

- Switching value S1 (switching point 1 in the selected unit)
- Switching characteristic of S1
MIN = Monitoring of minimum value
MAX = Monitoring of maximum value
- Hysteresis 1 (hysteresis value of S1 in the set unit)
- Switching value S2
- Switching characteristic of S2
- Hysteresis 2
- Code
After entering the **code 111**, further parameters can be defined:
- Filter (settling time of the display and output)
- Physical unit (Units)
- Output: 0..20 mA or 4..20 mA
- 0/4 mA (measured value corresponding to 0/4 mA)
- 20 mA (measured value corresponding to 20 mA)

For models with a voltage output, replace 20 mA accordingly with 10 V.

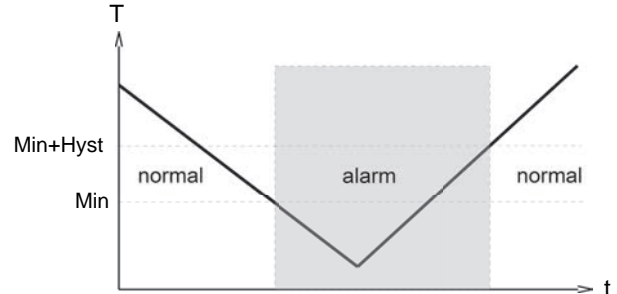
Edit, using position 2

If the currently visible parameter is to be modified:

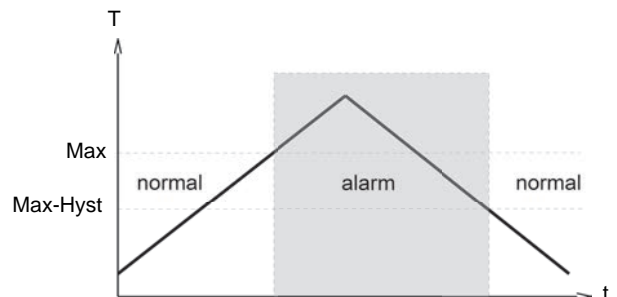
- Turn the annular gap to position 2, so that a flashing cursor appears which displays the position which can be modified.
- By repeatedly turning to position 2, values are increased; by turning to position 1, the cursor moves to the next digit
- Leave the parameter by turning to position 1 (until the cursor leaves the row); this accepts the modification.
- If there is no action within 30 seconds, the device returns to the normal display range without accepting the modification.

The limit switches S1 and S2 can be used to monitor minimal or maximal.

With a minimum-switch, falling below the limit value causes a switchover to the alarm state. Return to the normal state occurs when the limit value plus the set hysteresis is once more exceeded.



With a maximum-switch, exceeding the limit value causes a switchover to the alarm state. Return to the normal state occurs when the measured value once more falls below the limit value minus the set hysteresis.



The change to the alarm state is indicated by the integrated red LED and a cleartext in the display.

While in the normal state the switching outputs are at the level of the supply voltage; in the alarm state they are at 0 V, so that a wire break would also display as an alarm state at the signal receiver.

Overload display

Overload of a switching output is detected and indicated on the display ("Check S 1 / S 2"), and the switching output is switched off.

Simulation mode

To simplify commissioning, the sensor provides a simulation mode for the analog output. It is possible to create a programmable value in the range 0..26.0 mA at the output (without modifying the process variable). This allows the wiring run between the sensor and the downstream electronics to be tested during commissioning. This mode is accessed by means of **Code 311**.

Factory settings

After modifying the configuration parameters, it is possible to reset them to the factory settings at any time using **Code 989**.

Product Information

Sensors and Instrumentation

Ordering code

The basic device is ordered e.g. RT-xxx with electronics e.g. OMNI-RT-xxxx

RT- 1. 2. **A** 3. **K** 4. 5. **E** 6.

OMNI-RT- 7. 8. 9. **S** 10. 11.

○=Option

1. Nominal width							
015	DN 15 - G 1/2 A						
020	DN 20 - G 3/4 A						
025	DN 25 - G 1 A						
040	DN 40 - G 1 1/2 A						
050	DN 50 - G 2 A						
2. Mechanical connection							
A	male thread						
3. Housing material							
K	stainless steel						
4. Metering range							
001	0.11.. 1.1 m³/h						●
002	0.22.. 2.2 m³/h						●
004	0.40.. 4.0 m³/h						●
008	0.80.. 8.0 m³/h						●
016	1.60..16.0 m³/h						●
034	3.40..34.0 m³/h						●
068	6.80..68.0 m³/h						●
5. Connection for							
E	electronics						
6. Option							
H	high temperature model						
7. For nominal width							
015	DN 15 - G 1/2 A						●
020	DN 20 - G 3/4 A						●
025	DN 25 - G 1 A						●
040	DN 40 - G 1 1/2 A						●
050	DN 50 - G 2 A						●
8. Analog output							
I	current output 0/4..20 mA						●
U	○ voltage output 0/2..10 V						●
K	without						●
9. Electrical connection							
S	for round plug connector M12x1, 5-pole						
10. High temperature							
H	○ 150 °C version						
	○ tropical model						
O	○ oil-filled version for heavy duty or external use						
11. Option 2							
C	○ Counter C						
C1	○ Counter C1						

Preset Counter with external reset option, complementary switching outputs and actual value display (modified wiring diagram!)

Counter C1 (software option):
Instantaneous value display with analogue output, pulse-volume output and totalizer

Accessories

- Cable/round plug connector (KB...) see additional information "Accessories"
- Device configurator ECI-1

Архангельск (8182)63-90-72	Иваново (4932)77-34-06	Липецк (4742)52-20-81	Пенза (8412)22-31-16	Ставрополь (8652)20-65-13
Астана (7172)727-132	Ижевск (3412)26-03-58	Магнитогорск (3519)55-03-13	Пермь (342)205-81-47	Сурут (3462)77-98-35
Астрахань (8512)99-46-04	Иркутск (395)279-98-46	Москва (495)268-04-70	Ростов-на-Дону (863)308-18-15	Тверь (4822)63-31-35
Барнаул (3852)73-04-60	Казань (843)206-01-48	Мурманск (8152)59-64-93	Рязань (4912)46-61-64	Томск (3822)98-41-53
Белгород (4722)40-23-64	Калининград (4012)72-03-81	Набережные Челны (8552)20-53-41	Самара (846)206-03-16	Тула (4872)74-02-29
Брянск (4832)59-03-52	Калуга (4842)92-23-67	Нижний Новгород (831)429-08-12	Санкт-Петербург (812)309-46-40	Тюмень (3452)66-21-18
Владивосток (423)249-28-31	Кемерово (3842)65-04-62	Новокузнецк (3843)20-46-81	Саратов (845)249-38-78	Ульяновск (8422)24-23-59
Волгоград (844)278-03-48	Киров (8332)68-02-04	Новосибирск (383)227-86-73	Севастополь (8692)22-31-93	Уфа (347)229-48-12
Вологда (8172)26-41-59	Краснодар (861)203-40-90	Омск (3812)21-46-40	Симферополь (3652)67-13-56	Хабаровск (4212)92-98-04
Воронеж (473)204-51-73	Красноярск (391)204-63-61	Орел (4862)44-53-42	Смоленск (4812)29-41-54	Челябинск (351)202-03-61
Екатеринбург (343)384-55-89	Курск (4712)77-13-04	Оренбург (3532)37-68-04	Сочи (862)225-72-31	Череповец (8202)49-02-64
				Ярославль (4852)69-52-93

Киргизия (996)312-96-26-47 Казахстан (772)734-952-31 Таджикистан (992)427-82-92-69