Technical
Information
TI 041D/06/en
No. 50085734

Mass Flow Transmitter *procom DZL 363*

Multifunctional Transmitter for the Promass 63 Measuring System

Easy
- Fast commissioning using "Quick Setup"
- E+H operating matrix for all parameters
- Menu driven dialogue during operation
- Programmable function keys
- Four-line, backlit display
- Clear text display (multi-language)

Safe
- ISO 9001 manufacturer, quality assured
- CE conformity, EMC qualified
- EEPROM stores data on power failure (no batteries required)
- Permanent self-diagnosis with alarm function
- Ex e and Ex i connection to the Promass 63 sensors
- Two-wire connection for data transmission and sensor supply

Universal
- Can be combined with all Promass 63 sensors
- Broad functionality: *One* transmitter for mass, volume, density and temperature
- Several inputs and outputs
- Installation up to 1200 m from the sensor
- Racksyst cassette, panel mounted housing and field housing available
- Serial interfaces for digital communication
- Operation via Commuwin II

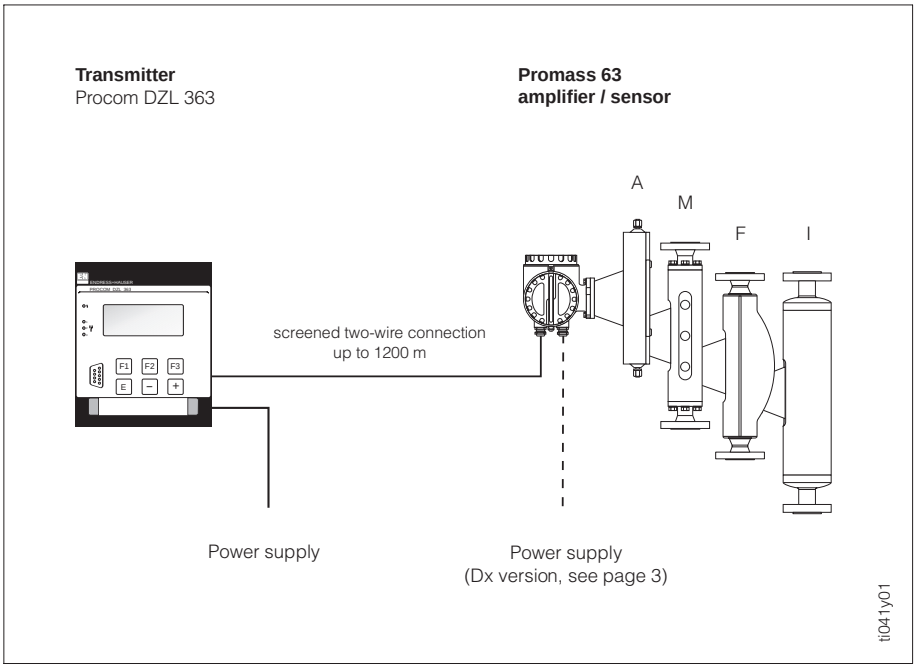
Endress+Hauser

Nothing beats know-how

Measuring system

Measuring system
The “Procom DZL 363” transmitter can be freely combined with any instrument of the modular Promass 63 measuring system. Therefore, the measuring device consists of:
- a Procom DZL 363 transmitter,
- a Promass 63 amplifier (blind version with “DZL 363” interface),
- Promass A, I, M or F sensor.

Fields of application
The Procom DZL 363 transmitter is a multifunctional device which substantially complements the range of possible applications of the already proven Promass 63 measuring system:
- Several inputs and outputs
- The Procom transmitter can be mounted at a distance of up to 1200 metres from the sensor, suitable for use in control rooms of medium-sized or large industrial plants.



The Procom DZL 363 – can be freely combined with all Promass 63 measuring instruments.

Programming
The “Quick Setup” programming menu allows fast commissioning of the transmitter, especially for standard applications.
For special applications the Procom DZL 363 offers a wide range of functions which the user can individually set, thereby tailoring the unit to the process conditions. All functions can be configured using the E+H programming matrix.

The most commonly used functions can be directly accessed using the three function keys.

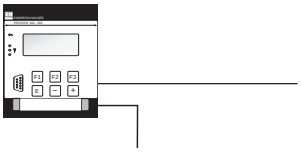
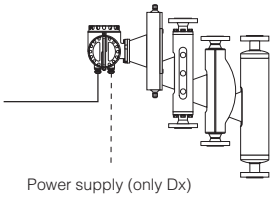
Display
The unit is equipped with a four-line backlit display. Actual process data, error messages as well as dialogue text for programming can be displayed in different languages.

Inputs and outputs
The Procom DZL 363 has several inputs and outputs for complex process control and automation systems:
- 4 totalizers
- 2 auxiliary inputs
- 3 current outputs
- 3 pulse/frequency outputs
- 3 relay outputs

All inputs and outputs are configurable via the E+H programming matrix:
- Input signal type
- Assignment of output variables
- Pulse output signal type
- Range scaling etc.

Using the Rackbus and HART interfaces, it can be connected via gateways to other E+H transmitters as well as to higher process control systems (MODBUS, PROFIBUS, etc.).

Combination Possibilities

	Procom DZL 363	Promass 63
	 Power supply	 Power supply (only Dx)
	Power supply *Order No.*	*Power supply* *Order No.*
DoS	85...253 V AC → DZL363 – * 51 *** 20...55 V AC/ → DZL363 – * 52 *** 20...62 V DC	by Procom → 63* ** – *********A3G
Dx	85...253 V AC → DZL363 – * 01 *** 20...55 V AC/ → DZL363 – * 02 *** 20...62 V DC	85...253 V AC → 63* ** – *********A1L 20...55 V AC/ → 63* ** – *********A2L 20...62 V DC Intrinsically safe version (Ex i) 85...253 V AC → 63* ** – *********A1M 20...55 V AC/ → 63* ** – *********A2M 20...62 V DC

DoS version
(Data over Supply)
Promass 63 is supplied with power by Procom DZL 363.

Dx version
Promass 63 with a separate power supply. Two-wire connection to Procom DZL 363 only for data transmission.

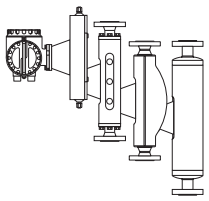
Ex Approvals Overview

For details: see separate Ex documentation

FM **CSA**
XP explosion proof
IS intrinsically safe [Ex ia]
NI non-incendive equipment
ANI –
AIS associated equipment [Ex ia]

* ANI generally included

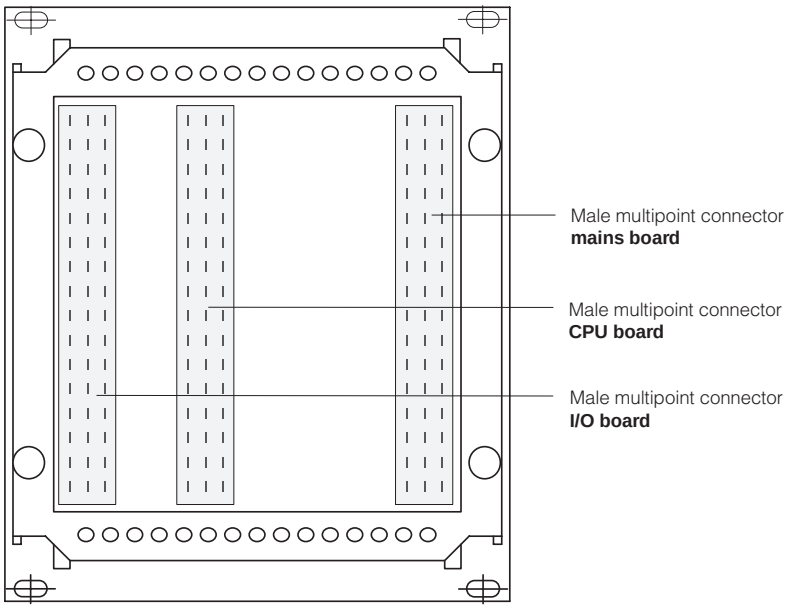
VDE 0165
Manufacturer's certificate for zone 2

Procom DZL 363			Promass 63			
			Zone 1	***Cl. I, Div. 1***	***Zone 2***	**Cl. I, Div. 2 Cl. II, Div. 1; Cl. III**
			CENELEC SEV	FM CSA	VDE 0165	FM CSA
						
Safe area Racksyst cassette, panel housing, field housing 	**DoS** CENELEC, SEV FM, CSA	– –	EEx de/d –	– XP	VDE 0165 –	– NI
	Dx CENELEC, SEV FM, CSA	– ANI *	EEx de/d –	– XP	VDE 0165 –	– NI, ANI
	Dx intrinsically safe CENELEC FM, CSA	[EEx ib] AIS	EEx de/d [ib] –	– XP, IS	– –	– –
Zone 2 ***Cl. I, Div. 2; Cl. II, Div. 1; Cl. III*** Field housing only 	**DoS** VDE 0165 FM, CSA	VDE 0165 NI	EEx de/d –	– XP	VDE 0165 –	– NI
	Dx VDE 0165 FM, CSA	VDE 0165 NI, ANI *	EEx de/d –	– XP	VDE 0165 –	– NI, ANI
	Dx intrinsically safe CENELEC, SEV FM, CSA	[EEx ib] NI, AIS	EEx de/d [ib] –	– XP, IS	– –	– –

Electrical Connections

Wiring diagram (Racksyst cassette, panel mounted housing)

Rear view



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	d	b	z	Mains board	
2	▮	▯	▮ ⏚	d2 = A data (Dx+) z2 = Earth connection	Sensor connection (only Dx version)
4	▮	▯	▮ ⏚	d4 = B data (Dx–) z4 = Earth connection	
6	▯	▯	▯		
8	▮	▯	▯	DoS +	Sensor connection (only DoS version)
10	▮	▯	▯	DoS –	
12	▮ ⏚	▮ ⏚	▮ ⏚	3 Earth connection terminals	Earth connections
14	▯	▯	▯		
16	▯	▯	▮ ⏚	1 Earth connection terminal	Earth connection
18	▮ ⏚	▮ ⏚	▮ ⏚	3 Earth connection terminals	Earth connections
20	▯	▯	▯		
22	▯	▯	▯		
24	▯	▯	▯		
26	▯	▯	▯		
28	▯	▯	▯		
30	▮ L1	▯	▮ L-	L1 for AC, L– for DC	Power supply
32	▮ N L1+	▯	▮ ⏚	N for AC, L+ for DC, z32 = Earth connection	

Caution!
At least two of the ground terminals z2, z4, z16, and z32 have to be connected to the protective earth. Terminals d12, b12, z12, d18, and z18 are additional earth terminals you may use to improve electromagnetic compatibility (EMC).

	d	b	z	CPU Board	
2	▯	▮	▮	b2 = B data z2 = A data	Rackbus RS 485 (Panel housing)
4	▯	▮	▮	b4 = Earth connection z4 = Rackbus data	E+H Rackbus (Rack)
6	▯	▯	▯		
8	▯	▯	▯		
10	▮ ⏚	▮ ⏚	▮ ⏚	3 Earth connection terminals	Earth connections
12	▯	▯	▯		
14	▯	▯	▯		
16	▮	▮	▮	d16/b16 = HART interface 1 z16 = MUS+	HART master interfaces (in prep.)
18	▮	▮	▮	d18/b18 = HART interface 2 z18 = MUS–	
20	▮ ⏚	▮ ⏚	▮ ⏚	3 Earth connection terminals	Earth connections
22	▯	▯	▯		
24	▮	▮	▮		External keyboard connection (in prep.)
26	▮	▮	▮		
28	▮	▮	▮		
30	▮	▯	▯		Data logger interface (in prep.)
32	▮	▮	▮		

	d	b	z	I/O Board	
2	▮	▮	▮	(+) Output: d2 = 1 b2 = 2 z2 = 3	Pulse/frequency outputs 1, 2, 3
4	▮	▮	▮	(–) Earth, all linked	
6	▮	▮	▯	(+) Current input: d6 = 1 b6 = 2	Current inputs 1, 2 (in prep.)
8	▮	▮	▯	(–) Earth connection: d8 = 1 b8 = 2	
10	▮	▮	▯	(+) Auxiliary input: d10 = 1 b10 = 2	Auxiliary inputs 1, 2
12	▮	▮	▯	(–) Earth connection: d12 = 1 b12 = 2	
14	▮	▮	▮	D Testing terminals for current measurement	Current outputs 1, 2, 3
16	▮	▮	▮	(+) Current output: d16 = 1; b16 = 2; z16 = 3	
18	▮	▮	▮	(–) Earth connection: d18 = 1; b18 = 2; z18 = 3	
20	▮ ⏚	▮ ⏚	▮ ⏚	3 Earth connection terminals	Earth connections
22	▮	▯	▮	d22 = NO contact z22 = NC contact	Relay output 1
24	▯	▮	▯	b24 = common contact	
26	▮	▯	▮	d26 = NO contact z26 = NC contact	Relay output 2
28	▯	▮	▯	b28 = common contact	
30	▮	▯	▮	d30 = NO contact z30 = NC contact	Relay output 3
32	▯	▮	▯	b32 = common contact	

Galvanic isolation

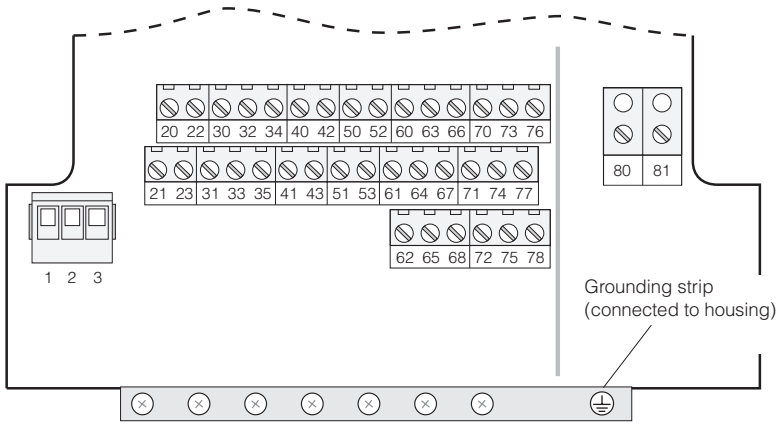
Power supply: 1000 V AC against earth, relays, inputs/outputs and sensor
Relays: 1000 V AC against earth, supply, inputs/outputs and sensor
Sensor connection: 1500 V AC against earth, supply, relays and inputs and outputs
Inputs/outputs: 500 V AC against earth

The inputs and outputs are combined into the following groups, each with the same earth and galvanically isolated from each other (500 V DC):

- Current output 1, 2, 3
- Current input 1, 2
- Pulse/frequency output 1, 2, 3
- RS 232 interface (socket on the display front panel) and keyboard connection

Electrical Connection

Wiring diagram (field housing)



Galvanic isolation: see page 5

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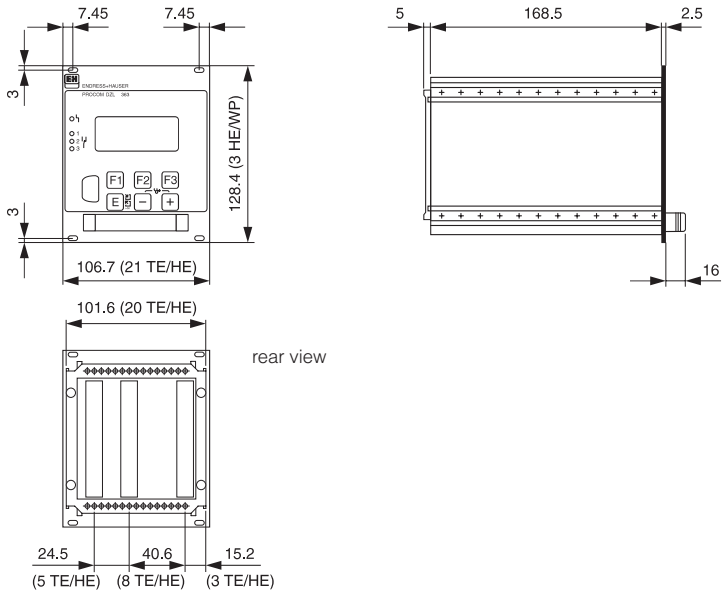
1 **2** **3** **Grounding strip**	L– for DC L1 for AC N for AC, L+ for DC Ground connection for protective earth and cable screen	Power supply
20 **21**	A data B data	Rackbus RS 485
22 **23**		Data logger (in prep.)
30 **32** **34** **31, 33, 35**	(+) Pulse/frequency output 1 (active or passive) (+) Pulse/frequency output 2 (active or passive) (+) Pulse/frequency output 3 (active or passive) (–) Common earth connection for all outputs	Pulse/frequency output 1, 2, 3
40 **41** **42** **43**	(+) Current input 1 (–) Earth connection current input 1 (+) Current input 2 (–) Earth connection current input 2	Current input 1, 2 (in prep.)
50 **51** **52** **53**	(+) Auxiliary input 1 (–) Earth connection auxiliary input 1 (+) Auxiliary input 2 (–) Earth connection auxiliary input 2	Auxiliary input 1, 2
60 **61** **63** **64** **66** **67** **62** **65** **68**	(+) Current output 1 (–) Earth connection current output 1 (+) Current output 2 (–) Earth connection current output 2 (+) Current output 3 (–) Earth connection current output 3 Testing terminal, current output 1 Testing terminal, current output 2 Testing terminal, current output 3	Current output 1, 2, 3
70 **71** **72**	(no) NO contact (c) Common contact (nc) NC contact	Relay output 1
73 **74** **75**	(no) NO contact (c) Common contact (nc) NC contact	Relay output 2
76 **77** **78**	(no) NO contact (c) Common contact (nc) NC contact	Relay output 3
80 **81**	Dx version: A data (Dx+) DoS version: DoS+ Dx version: B data (Dx–) DoS version: DoS–	Connection to the Promass sensor

Dimensions

19" Racksyst cassette (IP 20)



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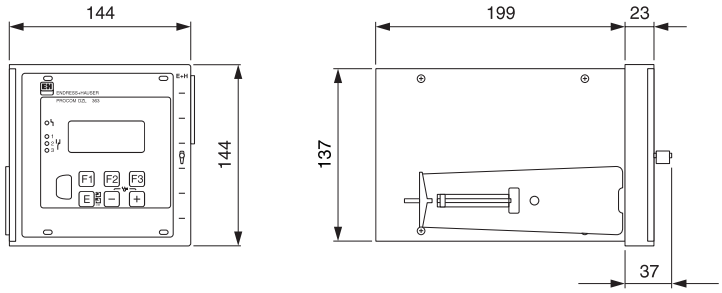
Panel mounted housing (IP 20; front door IP 54)



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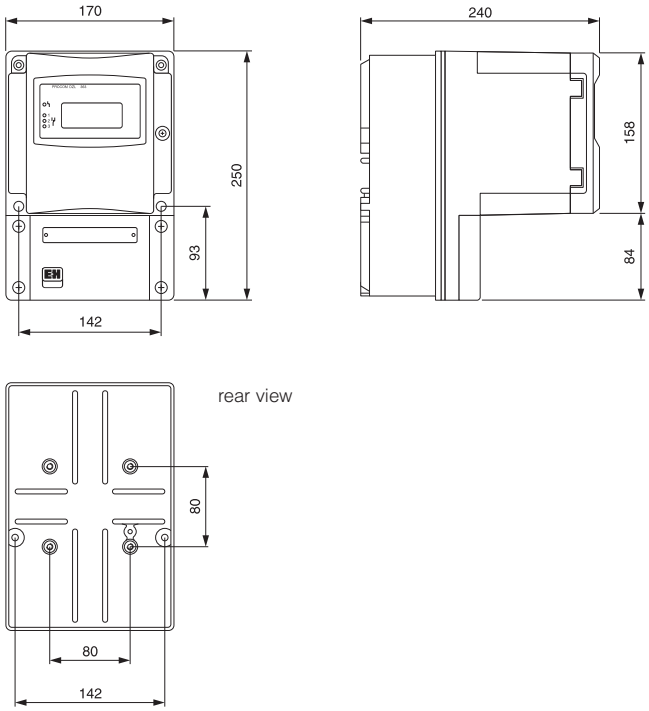
Field housing (IP 65)



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Technical Data

Application	
Instrument name	"Procom DZL 363" transmitter
Instrument function	Transmitter to process and display measuring data supplied by the Promass 63 flowmeters.
Function and system design	
Measuring principle	Transmitter for mass flow measurement according to the Coriolis measuring principle → see Technical Information TI 030D/06/en "Promass 63"
Measuring system	The complete measuring device consists of (see page 2): • a Procom DZL 363 transmitter, • a Promass 63 amplifier (blind version with "DZL 363" interface), and • Promass sensors A, I, M or F. Two versions are available: • *DoS version (Data over Supply)* → data transmission and power supply for Promass 63 on the common two-wire connection • *Dx version (Data exchange)* → two-wire connection only for data transmission. Promass 63 with a separate power supply.
Input variables	
Measured variables	Digital data exchange with Promass 63 sensors: • mass flow • fluid density • fluid temperature
Measuring range	Depending on the sensor used → see Technical Information TI 030D/06/en "Promass 63"
Operable flow range	Depending on the sensor used → see Technical Information TI 030D/06/en "Promass 63"
Auxiliary inputs	2 auxiliary inputs: U = 3...30 V DC, R_i = 1.8 kΩ pulsed or level mode Configurable for: totalizer reset, start/stop timer, start/stop batching, zero point adjustment, full scale switching, positive zero return, zero point selection, batch quantity selection.
Current inputs (in prep.)	0/4...20 mA, U_{max} = 24 V DC
Output variables	
Output signal	• *Relay output 1* max. 250 V AC / 1 A or max. 30 V DC / 0.1 A NO contact or NC contact available Configurable for: error message (failure), empty pipe detection, full scale switching, batch contact, batch precontact, time measurement with totalizer, flow direction, limit value. • *Relay output 2 and 3* max. 250 V AC / 1 A or max. 30 V DC / 0.1 A; NO contact or NC contact available Configurable like relay 1 except for "FAILURE". • *Current output 1, 2 and 3* 0/4...20 mA (also acc. to NAMUR recommendations), R_L <700 Ω, freely assignable to different measured values, time constant freely selectable (0.01...100.00 s), full scale value selectable, temperature coefficient typ. 0.005% o.f.s./°C Current output 1: with HART protocol

Output variables (continued)	
Output signal (continued)	• *Pulse/frequency output 1, 2 and 3* freely assignable to one flow variable, active or passive active: 24 V DC, 25 mA (250 mA during 20 ms), R_L > 100 Ω, passive: 30 V DC, 250 mA – *Frequency output:* full scale frequency selectable up to 10 kHz, On/off ratio 1:1, pulse width max. 2 s – *Pulse output:* pulse value adjustable, pulse polarity selectable, pulse width adjustable (50 ms...2 s), above a frequency of $^{1}/_{(2 \times \text{pulse width})}$ the on/off ratio is 1:1
Signal on alarm	The following applies until the fault has been cleared: • Current output → failure mode selectable • Pulse/frequency output → failure mode selectable • Relay 1 → de-energised if configured to "FAILURE"
Load	R_L < 700 Ω (current output)
Creep suppression	Switch points for low flow selectable. Hysteresis: –50 %
Accuracy (process data)	
Reference conditions (Promass sensor)	Error limits based on ISO/DIS 11631: • 20...30 °C; 2...4 bar • Calibration rig traceable to national standards • Zero point calibrated under operating conditions • Field density calibration carried out (or special density calibration)
Measured error	Depending on the Promass sensors. For further details → see Technical Information TI 030D/06/en "Promass 63" Note! • The values shown there refer to the pulse/frequency output. • Additional error of the current output: ±5 µA typical.
Repeatability	Depending on the Promass sensors. For further details → see Technical Information TI 030D/06/en "Promass 63"
Operating conditions	
Installation conditions	
Installation instructions	Installation possible in all positions.
Connection cable length	max. 1200 metres between transmitter and sensor screened cable, loop resistance max. 44 Ω
Ambient conditions	
Ambient temperature	–25...+40 °C (for all housing types) An all-weather cover should be used to protect the housing from direct sunlight when mounting in the open. This is especially important in warmer climates and with high ambient temperatures.
Storage temperature	–40...+80 °C
Degree of protection (EN 60529)	Racksyst cassette: IP 20 Panel mounted housing: IP 20 (front door: IP 54) Field housing: IP 65
Shock resistance	according to IEC 68-2-31

Technical Data

Operating conditions (continued)	
Vibrational resistance	1 g, 10...150 Hz according to IEC 68-2-6
Electromagnetic compatibility (EMC)	According to EN 50081 Part 1 and 2 / EN 50082 Part 1 and 2 as well as to NAMUR recommendations
Mechanical construction	
Design, Dimensions (L x B x H)	Racksyst cassette (19" / 21 TE): 192 x 106.7 x 128.4 mm Panel mounted housing: 236 x 144 x 144 mm Field housing: 250 x 170 x 240 mm Dimensional drawings → see page 7
Weights	Racksyst cassette: 0.9 kg Panel mounted housing: 1.7 kg (without Racksyst cassette) Field housing: 5.0 kg (without Racksyst cassette)
Materials	*Racksyst cassette* • Front plate made of aluminium with glued-on synthetic foil • Cassette housing made of aluminium and galvanized steel *Panel mounted housing* • Front door made of painted aluminium with inspection window • Tubus made of stainless steel *Field housing* • Housing body made of painted aluminium • Inspection window made of polycarbonate
Electrical connection	• Wiring diagrams: see page 4 ff. • Female multipoint connectors or cable glands: Field housing: PG 13.5 cable glands (5...15 mm) or $^1/_2$" NPT, M20 x 1.5 (8...15 mm), G $^1/_2$" threads for cable glands Racksyst cassette/panel mounted housing: Female multipoint connectors type F according to DIN 41612 • Galvanic isolation: All circuits for inputs, outputs, power supply, and sensor are galvanically isolated from each other (see page 5).
User interfaces	
Operation	On-site operation with: • 3 operating elements for setting all instrument functions in the Endress+Hauser operating matrix. • 3 configurable function keys for quick access to frequently-used functions. • Diagnostic or help function (⊡)
Display	LC-display, illuminated, double-spaced with 16 characters each
Communication	• E+H Rackbus and Rackbus RS 485 interface (Rackbus protocol) • HART protocol via current output 1
Power supply	
Supply voltage, frequency	*Transmitter:* 85...253 V AC (45...65 Hz) 20...55 V AC, 20...62 V DC *Sensors:* • DoS version: Supply by way of the Procom DZL 363 transmitter via the two-wire connection, 45...55 V DC, galvanically isolated • Dx version: Promass 63 sensor with separate supply (connection values: see Technical Information TI 030D/06/en “Promass 63”)

Power supply (continued)	
Power consumption	*DoS version:* AC: <30 VA (incl. sensor) DC: <30 W (incl. sensor) *Dx version:* AC: <25 VA DC: <25 W
Power supply failure	Bridges min. one power cycle (22 ms). • EEPROM saves measuring system data on power failure (no batteries required). • DAT = exchangeable data storage module which stores all sensor data.
Certificates and approvals	
Ex approvals	Information on presently available Ex versions (e.g. CENELEC, SEV, FM, CSA) can be supplied by your E+H Sales Centre on request. All explosion protection data are given in separate documentation available on request. Overview of Ex approvals → see page 3
CE mark	By attaching the CE-mark, Endress+Hauser confirms that the Procom DZL 363 transmitter has been successfully tested and fulfils all legal requirements of the relevant EC directives.
Order information	
Accessories	• Plug-in point installation kit (Order No. 500 48140) • Plug-in point installation kit for Ex versions (Order No. 500 48144) • Post mounting set for field housing (Order No. 500 61357)
Supplementary documentation	System Information Procom DZL 363 SI 023D/06/en Operating Manual Procom DZL 363 BA 036D/06/en Ex documentation Procom DZL 363 EX ... D/06/.. (various documentation) System Information Promass SI 014D/06/en Technical Information Promass 63 TI 030D/06/en Operating Manual Promass 63 BA 014D/06/en
Other standards and guidelines	
EN 60529	Degrees of protection provided by enclosures (IP Code)
EN 61010	Protection Measures for Electronic Equipment for Measurement, Control, Regulation and Laboratory Procedures
EN 50081	Part 1 and 2 (interference emission)
EN 50082	Part 1 and 2 (interference immunity)
NAMUR	Association of Standards for Measurement and Control in the Chemical Industry

Product Structure

Procom DZL 363 Transmitter

Approvals

0 For use in non-hazardous area
1 VDE 0165 cert. of conformity Zone 2
3 CENELEC: [EEx ib] IIC / IIB (not for DoS connection)
5 FM: NI / I / 2 / ABCD
6 FM: NI / I / 2 / ABCD; AIS / I / II / III / 1 / ABCDEFG (not for DoS connection)
A CSA: non-incendive CI I Div. 2
B CSA: non-incendive CI I Div. 2; [Ex ia] (not for DoS connection)
F SEV: [Ex ib] IIC / IIB (not for DoS connection)
9 other

Promass Connection

0 Two-wire connection, data only
5 DoS two-wire connection, data incl. power supply for Promass 63
9 other

Power supply

1 85...253 V, 50/60 Hz power supply
2 20...55 V AC, 20...62 V DC power supply
9 other

Housing

R0 19" rack unit (21 TE)
F1 Field housing IP 65, PG 13.5 glands (not for FM and CSA)
F2 Field housing IP 65, M20 entries (not for FM and CSA)
F3 Field housing NEMA 4X, NPT 1/2" entries
F4 Field housing IP 65, G 1/2" entries (not for FM and CSA)
P1 Panelmount housing, soldering lugs on connecting strips
P2 Panelmount housing, terminal screws on connecting strips
99 other

Digital communication

1 Rackbus / Rackbus RS 485 or HART protocol
9 other

Version

1 Basic version for mass flow, density and temperature measurement with batching and density functions
9 other

DZL 363–						

⇐ Order code
For the various combination possibilities of Procom DZL 363 with Promass 63 → see page 3

Subject to modification

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Endress+Hauser
Nothing beats know-how

12.97

TI 041D/06/en/03.98
CV5.0