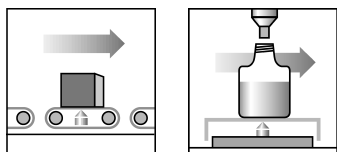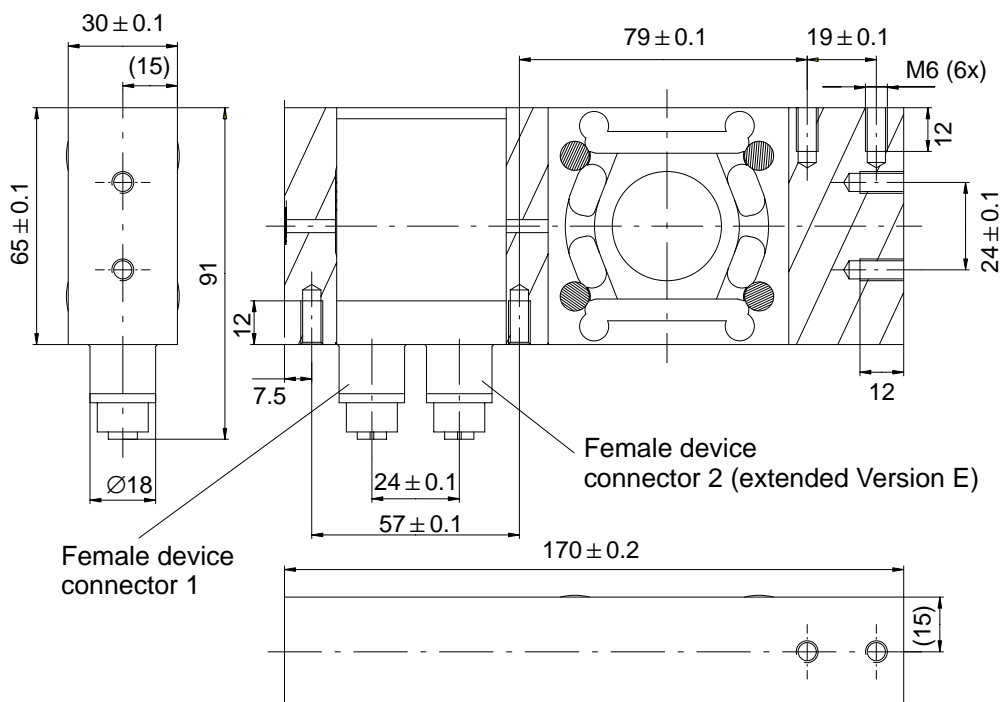# FIT®/5...

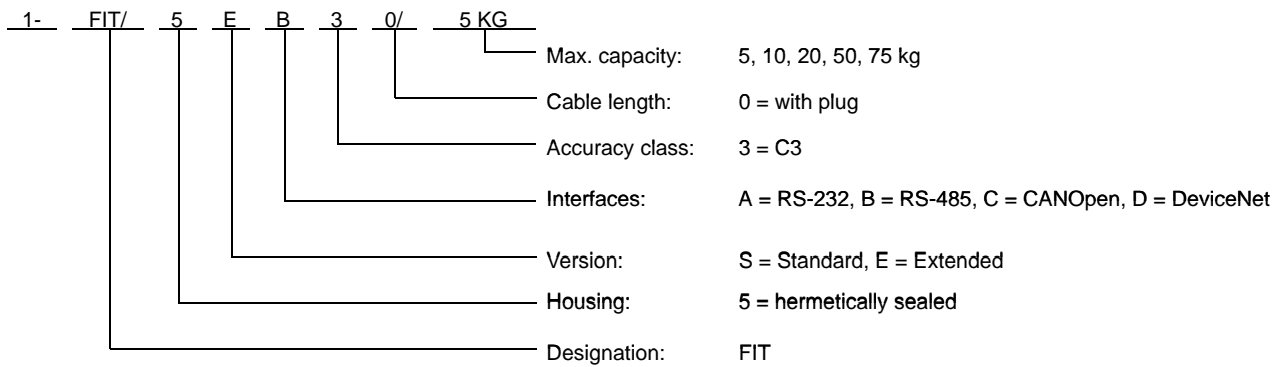## Digital load cell for dynamical weighing

Special features

- **4 limit switches with hysteresis**
- **Dosing functionalities and diagnostic channel (Type E)**
- **integrated overload protection (Patent announced)**
- **Trigger function (external or level trigger)**
- **PC-Software for parameter adjustment and dynamical analysis**
- **hermetically sealed stainless steel housing IP68**
- **Test report for 3000 d accord. to OIML R 60, R 76**

Dimensions (in mm; 1 mm = 0.03937 inches)

30 ± 0.1
(15)
65 ± 0.1
91
12
Ø18

79 ± 0.1
19 ± 0.1
M6 (6x)
12
24 ± 0.1
12
7.5
24 ± 0.1
57 ± 0.1

Female device connector 1

Female device connector 2 (extended Version E)

170 ± 0.2
(15)

HBM

The FIT/... digital load cells are available in different versions, e.g.:

```
1-   FIT/  5  E  B  3  0/   5 KG
```

Max. capacity:	5, 10, 20, 50, 75 kg
Cable length:	0 = with plug
Accuracy class:	3 = C3
Interfaces:	A = RS-232, B = RS-485, C = CANOpen, D = DeviceNet
Version:	S = Standard, E = Extended
Housing:	5 = hermetically sealed
Designation:	FIT

HBM has defined so-called preferred variants. All other variants are available on request.

Preferred variants of the standard types

Housing	Interface			
	RS-232	RS-485 (4 wire)	CANOpen	DeviceNet
FIT/0	1-FIT/0SA30/5KG 1-FIT/0SA30/10KG 1-FIT/0SA30/20KG 1-FIT/0SA30/50KG 1-FIT/0SA30/75KG	1-FIT/0SB30/5KG 1-FIT/0SB30/10KG 1-FIT/0SB30/20KG 1-FIT/0SB30/50KG 1-FIT/0SB30/75KG	1-FIT/0SC30/5KG 1-FIT/0SC30/10KG	1-FIT/0SD30/5KG 1-FIT/0SD30/10KG
FIT/1	1-FIT/1SA31/5KG 1-FIT/1SA31/10KG 1-FIT/1SA31/20KG 1-FIT/1SA31/50KG 1-FIT/1SA31/75KG	1-FIT/1SB31/5KG 1-FIT/1SB31/10KG 1-FIT/1SB31/20KG 1-FIT/1SB31/50KG 1-FIT/1SB31/75KG 1-FIT/1SB32/5KG 1-FIT/1SB32/10KG 1-FIT/1SB32/20KG	1-FIT/1SC31/5KG 1-FIT/1SC31/10KG	1-FIT/1SD31/5KG 1-FIT/1SD31/10KG
FIT/4		1-FIT/4SB32/5KG 1-FIT/4SB32/10KG 1-FIT/4SB32/20KG		
FIT/5	1-FIT/5SA30/5KG 1-FIT/5SA30/10KG 1-FIT/1SA30/20KG		1-FIT/5SC30/5KG 1-FIT/5SC30/10KG	

Preferred variants of the extended types

In addition to the standard version (S), another extended version (E) with control functions (two connectors) is available. All versions offers additional application areas with limit values and dosing control functions (e.g. sorting systems, filling systems).

Housing	Inteface			
	RS-232	RS-485 (4 wire)	CANOpen	DeviceNet
FIT/0	1-FIT/0EA30/5KG 1-FIT/0EA30/10KG 1-FIT/0EA30/20KG 1-FIT/0EA30/50KG 1-FIT/0EA30/75KG	1-FIT/0EB30/5KG 1-FIT/0EB30/10KG 1-FIT/0EB30/20KG 1-FIT/0EB30/50KG 1-FIT/0EB30/75KG	1-FIT/0EC30/5KG 1-FIT/0EC30/10KG	1-FIT/0ED30/5KG 1-FIT/0ED30/10KG
FIT/1	1-FIT/1EA31/5KG 1-FIT/1EA31/10KG 1-FIT/1EA31/20KG 1-FIT/1EA31/50KG 1-FIT/1EA31/75KG	1-FIT/1EB31/5KG 1-FIT/1EB31/10KG 1-FIT/1EB31/20KG 1-FIT/1EB31/50KG 1-FIT/1EB31/75KG	1-FIT/1EC31/5KG 1-FIT/1EC31/10KG	1-FIT/1ED31/5KG 1-FIT/1ED31/10KG
FIT/4	–	1-FIT/4EB31/5KG 1-FIT/4EB31/10KG 1-FIT/4EB32/5KG 1-FIT/4EB32/10KG	1-FIT/4EC31/5KG 1-FIT/4EC31/10KG	1-FIT/4ED31/5KG 1-FIT/4ED31/10KG
FIT/5	1-FIT/5EA30/5KG 1-FIT/5EA30/10KG	1-FIT/5EB30/5KG 1-FIT/5EB30/10KG	1-FIT/5EC30/5KG 1-FIT/5EC30/10KG 1-FIT/5EC30/20KG	1-FIT/5ED30/5KG 1-FIT/5ED30/10KG

= for these load cell types separate data sheets are available

Specifications

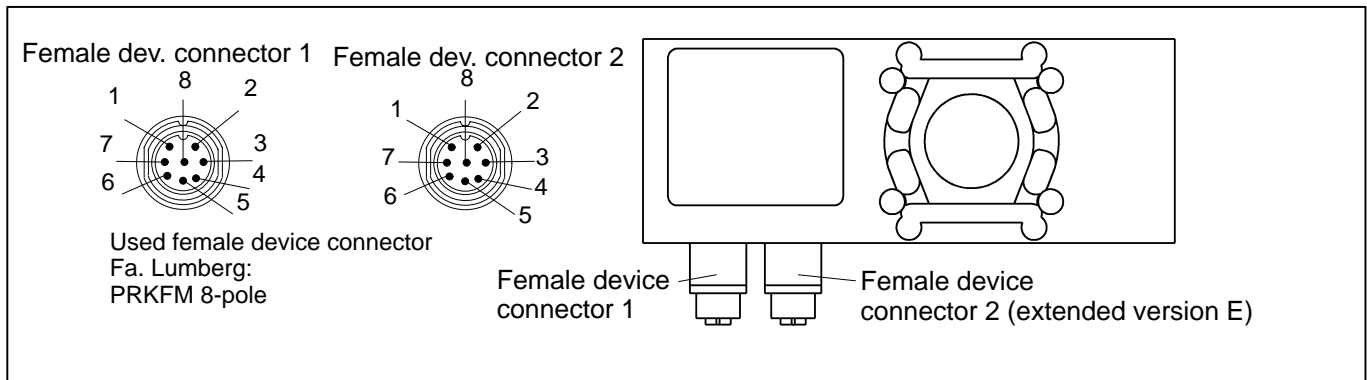| Type		FIT/5...		
Accuracy class according to OIML R60		**C3**		
Max. capacity (E_{max})	kg	5	10	20
Min. load cell verification interval (v_{min})	g	0.5	1	2
Min. application range for 3000 d	kg	1.5	3	6
Max. platform size	mm	L 400 x W 400		
Max. number of load cell verification intervals (n_{LC})		3000		
Apportionment factor (p_{LC})		1		
Temperature effect on sensitivity (TK_C)[1] [2] **in temperature range 0 °C...+40 °C [+32 °F...+104 °F]**	% of C_n/10K	$\pm$ 0.0250		
Temperature effect on zero signal (TK_{S0})[2]		$\pm$ 0.0200		
Hysteresis factor (d_{hy})[1] [2]		$\pm$ 0.0166		
Nonlinearity (d_{lin})[1] [2]	% of C_n	$\pm$ 0.0166		
Creep (d_{CR}) over 30 min		$\pm$ 0.0166		
Eccentric loading error acc. to OIML R76		$\pm$ 0.0233		
Service load (E_U); max. 120 mm eccentricity		150		
Safe load limit (E_L); max. 20 mm eccentricity	% of E_{max}	1000		
Permissible dyn. load (F_{srel}) **max. 50 mm eccentricity**		70		
Deflection at max. capacity (s_{nom})	mm	< 0.15		
Power supply: **Supply voltage UB1 (DC)**	V	+ 10 ... +30		
Power consumption	W	$\leqq$ 2		
Switch-on current	A	0.2		
Resolution of meas. signal (1 Hz-Filter)	Bit	20		
Measuring rate	1/s	4 ... 1200		
Adjustable cut-off frequency of the digital filters				
Filtermode 0	Hz	200 ... 0.25		
Filtermode 1 (response time 62 ... 365 ms)	Hz	18 ... 2.5		
Baud rate (RS-232-, RS-485-interface)	Baud	1200; 2400; 4800; 9600; 19200; 38400; 57600; 115200		
Max. number of bus members		90		
CANopen interface		Standard CiA DS301		
Baud rate	Baud	10 000 ... 1 000 000		
DeviceNet interface		Release 2.0 ODVA		
Baud rate	Baud	125 000 ... 500 000		
max. cable length (CANOpen, DeviceNet)	m	$\leq$ 5000 (10KBaud)... $\leq$ 100 (500KBaud), $\leq$ 25 (1MBaud)		
Diagnostic channel, RS-485-2-wire (extended version E, female dev. conn. 2) **Baud rate**	Baud	38 400		
max. cable length	m	500		
Max. number of bus members		90		
Asynchronous serial interface (female device connector 1) **RS-485, 4 wire, max. cable length**	m	500		
RS-232 max. cable length	m	15		
Trigger input (female device connector 1) **Permissible input voltage**	V	0 ... +12		
Low-level	V	< 1		
High-level	V	> 4		
Input resistance	kΩ	10		
Control inputs (extended version E, female device connector 2)		isolated, reference potential GND2		
Permissible input voltage	V	0 ... +30		
Low-level	V	< 6		
High-level	V	>10		
Input resistance	kΩ	> 3		
Control outputs (extended version E, female device connector 2)		isolated, reference potential GND2		
External supply voltage UB2	V	+11 ... +30		
Max. current of one output	A	< 0.5		
Accumulated current of all outputs	A	<1.0		
Voltage drop	V	< 1		

1) The values can be exceeded in individual cases. The resulting errors of TK_C, nonlinearity and hysteresis don't exceed the maximum permissible errors of OIML R 60 with p_{LC} = 1.

2) All relative errors are related to the output signal at max. capacity.

Specifications (continuation)

Nominal temperature range	°C [°F]	–10 ... +40 [+14 ... +104]
Operating temperature range	°C [°F]	–10 ... +50 [+14 ... +122]
Storage temperature range	°C [°F]	–25 ... +75 [–13 ... +167]
EMC-requirements		EN 45501, OIML R76
		EN 61326-1/Tab. 4, equipment of class B
		EN 61326/A1, Tab. A1, equipment in industrial areas
Degree of protection acc. to EN 60529		IP 68
Female device connector		Female device connector, Fa. Lumberg, 8-pole
Material		Stainless steel
Weight, approx.	kg	2

Electrical connection

Female dev. connector 1

Female dev. connector 2

Used female device connector
Fa. Lumberg:
PRKFM 8-pole

Female device connector 1

Female device connector 2 (extended version E)

Female device connector 1				Female device conn. 2 (optional)	
Pin-No.	**RS-232**	**RS-485**	**CANOpen/DeviceNet**	**Pin-No.**	
7	TxD	TA	CANH out	1	OUT 1
3	RxD	RA	CANH in	2	OUT 2
6	–	TB	CANL out	3	OUT 3
5	–	RB	CANL in	4	OUT 4
8	UB 1	UB 1	UB 1	5	UB 2
1	GND 1	GND 1	GND 1	6	GND 2
4 [1]	Diag. Ra/Ta or Trigger	Diag. Ra/Ta or Trigger	Diag. Ra/Ta or Trigger	7	IN 1
2 [1]	Diag. Rb/Tb	Diag. Rb/Tb	Diag. Rb/Tb	8	IN 2

[1] The standard version (S) does not have a diagnostic channel. Pin 2 is not assigned, Pin 4 is trigger input.

Accessories, to be ordered separately

Connection cable

Material: PUR, $\varnothing 7 \pm 0.5$ mm, Female device connector / free ends

Length	3 m
Cable (8 cores)	1-KAB165-3[*]

[*] The cable is suitable only for experimental purposes for the structure of CANOpen and DeviceNet bus systems (the characteristic wave impedance does not correspond to the CANOpen specifications)

1-FIT-AED-DOC = Documentation (CD-ROM with Operating manual and AED-Panel program AED_Panel32)

- Documentation of mechanics and electronics
- Documentation of command codes for the communication with the FIT/5... load cell
- Software package for parameter setting and dynamic analysis of the weighing system

1-FIT-AED-KIT = Starter kit for CANOpen and DeviceNet