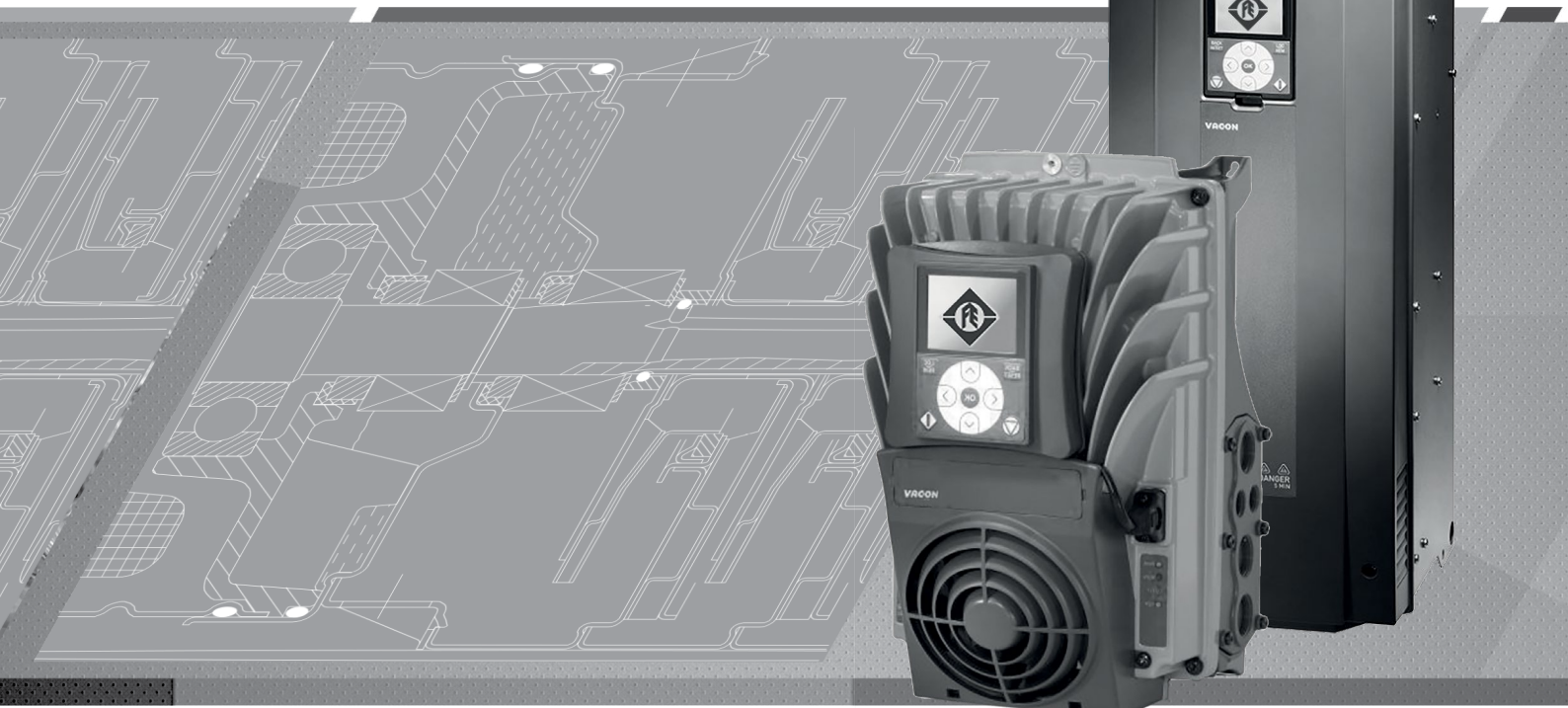


6"/8" HES

Quick Installation Guide






Summary*


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Battery Installation Procedure IP66 / IP21	5
Connection Description 6"/ 8" HES Sytem Standard	6
System and Connection Description 6" HES solar	7
Connections Motor and Option cards	8
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* This manual always refers to the latest Franklin Electric operating software version for the HES Vacon frequency inverters.

Additional safety instructions

 DANGER	<p>System can automatically restart (Solar) - the appropriate safety precautions should be taken. See page 19</p>
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Additional pre- operation instructions

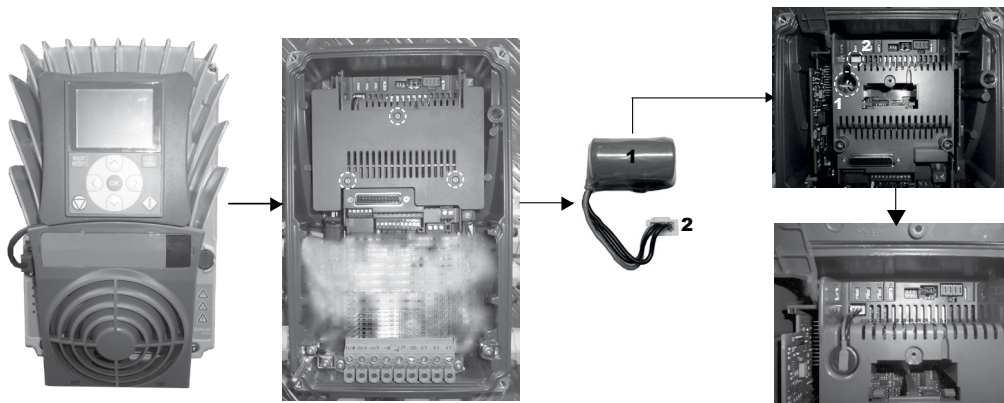
 CAUTION	<p>Using an appropriate output filter (sine or dV/dT), check the switching frequency (standard value 4 kHz), if necessary adjust it according to the information on the filter type label.</p> <p>The switching frequency parameters are located within parameter group 3 under motor control.</p>
-------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Control modes and necessary sensor technologies

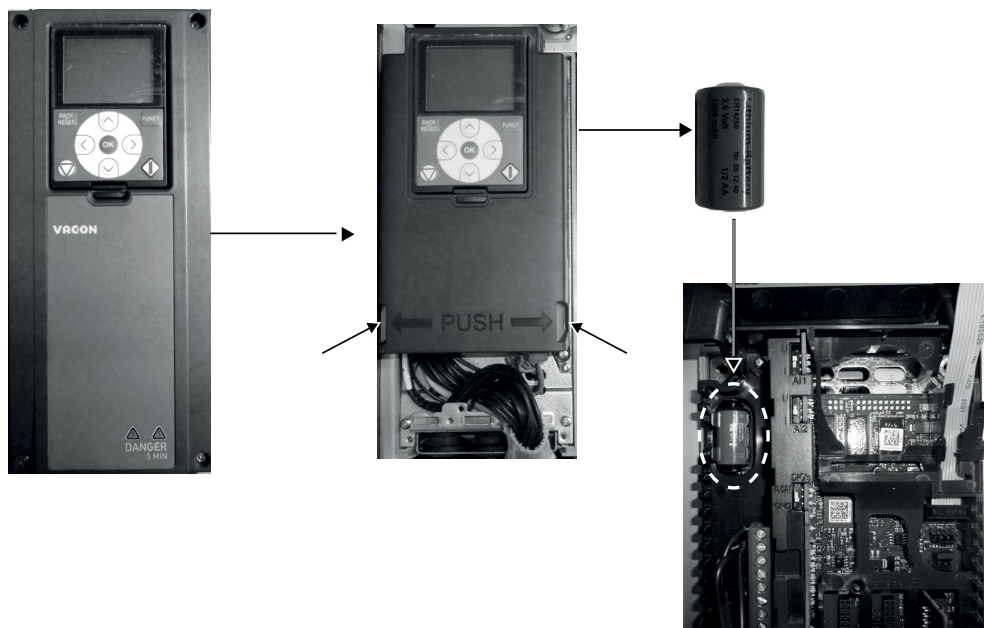
Process reference	Control reference	Flow meter	Pressure sensor	Level sensor	PT100 sensor & Drive slot card	Flow switch (digital)
Q - Flow	No (Optional)	mandatory			Optional	
	P	mandatory	mandatory			
	H	mandatory		mandatory		
P - pressure	No (Optional)	Yes*	mandatory		mandatory*	
	Q	mandatory	mandatory			
H - level	No (Optional)	Yes*		mandatory	mandatory*	
	Q	mandatory		mandatory		
Direct Mode	No	Yes**	No	No	mandatory*	No
Manual Mode	No				Yes*	
Solar	No				Yes*	mandatory

*please consult Franklin Electric
 ** need to be evaluated to PLC

Battery Installation Procedure IP66



Battery Installation Procedure IP21



Connections 6" / 8" HES Standard System

Standard I/O			
Terminal	Signal		
1	+10 Vref	Reference output	
2	AI1+	Analogue input, voltage or current	Control Reference: AI1, Terminals 2(+), 3(GND) (Connection depending on settings)
3	AI1-	Analogue input common	
4	AI2+	Analogue input, voltage or current	Process Reference: AI2, Terminals 4(+), 5(GND) Default setting [mA]
5	AI2-	Analogue input common	
6	24V out	24V aux. voltage	
7	GND	I/O ground	
8	DI1	Digital input 1	Start/Stop: DI1, Terminals 6(+24V), 8(DI1)
9	DI2	Digital input 2	External Fault: DI2, Terminals 6(+24V), 9(DI2)
10	DI3	Digital input 3	Manual Operation: DI3, Terminals 6(+24V), 10(DI3)
11	CM	Common for DI1 - DI6*	
12	24V out	24V aux. voltage	
13	GND	I/O ground	
14	DI4	Digital input 4	Set Point - : DI4, Terminals 6(+24V), 14(DI4)
15	DI5	Digital input 5	Set Point + : DI5, Terminals 6(+24V), 15(DI5)
16	DI6	Digital input 6	Reset: DI6, Terminals 6(+24V), 16(DI6)
17	CM	Common for DI1 - DI6*	
18	AO1+	Analogue output, voltage or current	
19	AO-/GND	Analogue output common	
30	+24V in	24V aux. input voltage	
A	RS485	Serial bus, negative	
B	RS485	Serial bus, positive	

* Can be isolated from ground, see chapter 5.1.6.

Fig. 1: Input/Output Terminals



Relays				
Terminal	Signal			
21	RO1/1		Relay output 1	
22	RO1/2			
23	RO1/3			
24	RO2/1		Relay output 2	
25	RO2/2			
26	RO2/3			
		Operation: RO1, Terminals 22(+24V), 23	Switching capacity	24VDC/8A 250VAC/8A 125VAC/0,4A
		Warning/Fault: RO2, Terminals 25(+24V), 24	Min. switching load	5V/10mA

Fig. 2: Relais Output Connection

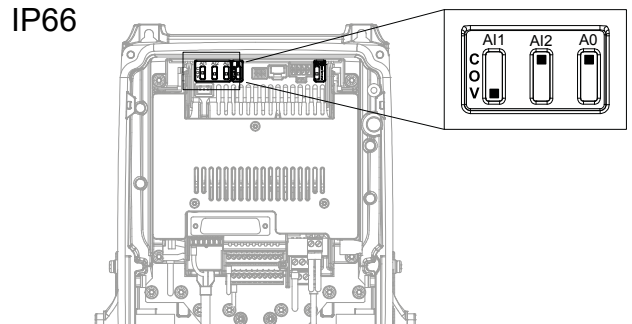
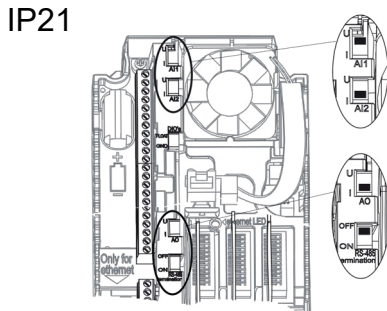


Fig. 3: Analog Input/Output Signal Selection

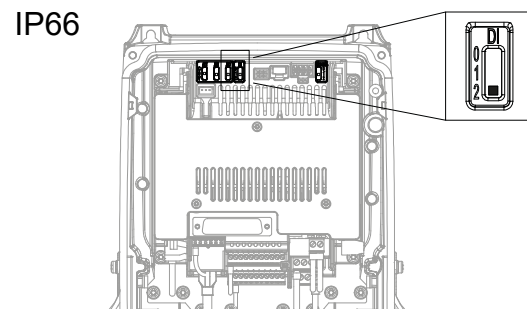
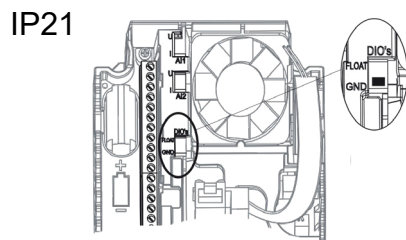


Fig. 4: Digital Input Selection

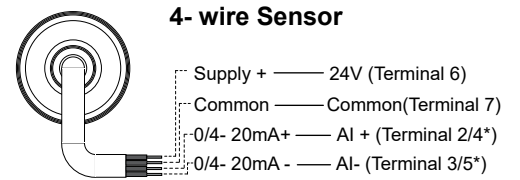
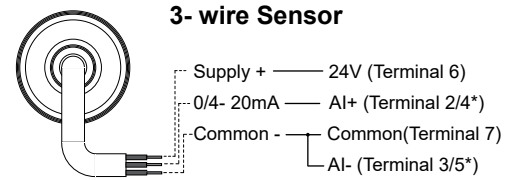
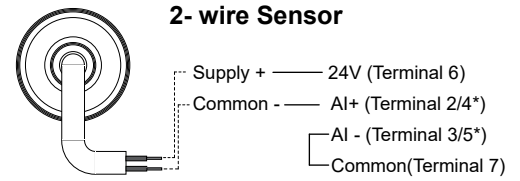
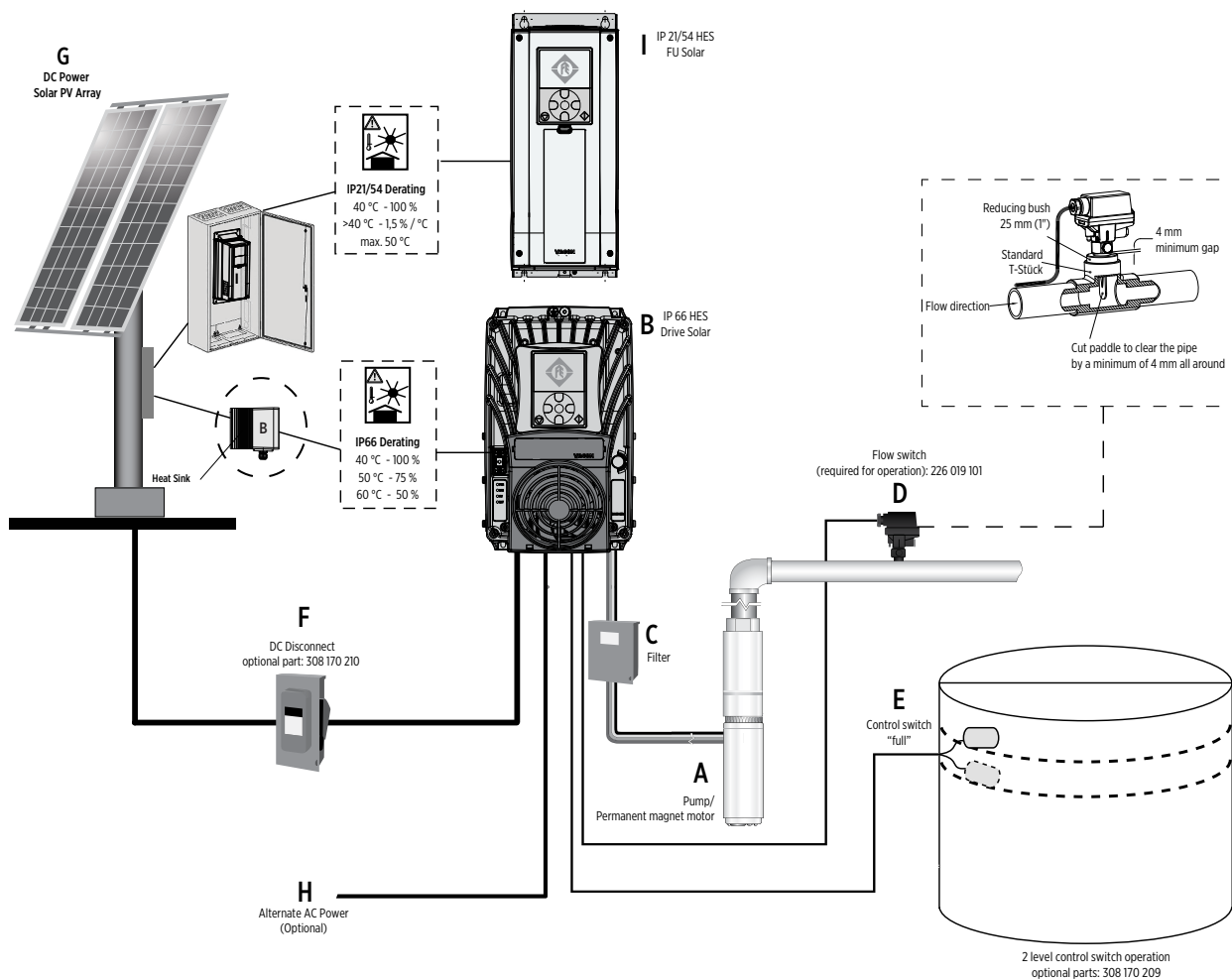


Fig. 1.1 : Sensor connection
* depending on Reference



6" HES Solar System



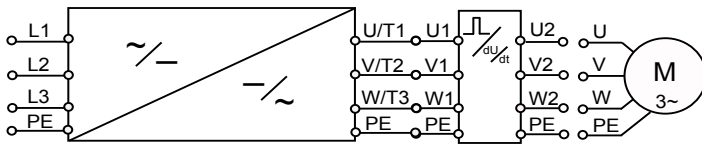
Connections 6" HES Solar System

Standard I/O			
Terminal	Signal		
1	+10 Vref	Reference output	
2	AI1+	Analogue input, voltage or current	
3	AI1-	Analogue input common	
4	AI2+	Analogue input, voltage or current	
5	AI2-	Analogue input common	
6	24V out	24V aux. voltage	
7	GND	I/O ground	
8	DI1	Digital input 1	Start/Stop: DI1, Terminals 6(+24V), 8(DI1)
9	DI2	Digital input 2	Flow Switch: DI2, Terminals 6(+24V), 9(DI2)
10	DI3	Digital input 3	Manual Operation: DI3, Terminals 6(+24V), 10(DI3)
11	CM	Common for DI1 - DI6*	
12	24V out	24V aux. voltage	
13	GND	I/O ground	
14	DI4	Digital input 4	Control Switch „Empty“ DI4, Terminals 6(+24V), 14(DI4)
15	DI5	Digital input 5	Control Switch „Full“ DI5, Terminals 6(+24V), 15(DI5)
16	DI6	Digital input 6	Reset: DI6, Terminals 6(+24V), 16(DI6)
17	CM	Common for DI1 - DI6*	
18	AO1+	Analogue output, voltage or current	
19	AO-/GND	Analogue output common	
30	+24V in	24V aux. input voltage	
A	RS485	Serial bus, negative	
B	RS485	Serial bus, positive	

* Can be isolated from ground, see chapter 5.1.6.

Fig. 5: Input/Output Terminals

Connections Motor and Option cards



Color code FE Motor Short Lead:

U - brown

V - grey

W - black

Fig. 6: Supply and motor connection

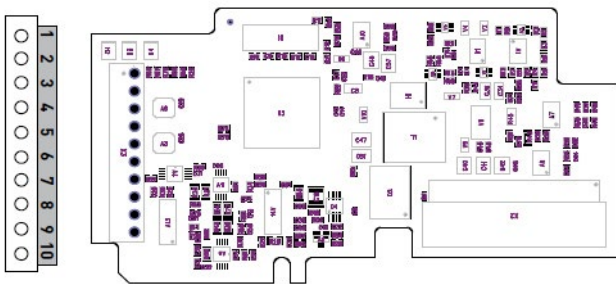


Fig. 7: PT100 card (left slot)

Color code FE PT100 Lead:

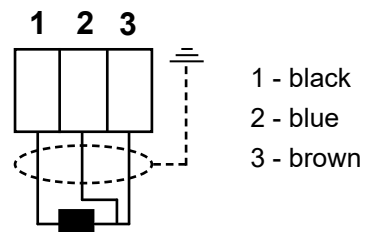


Fig. 8: PT100 connection

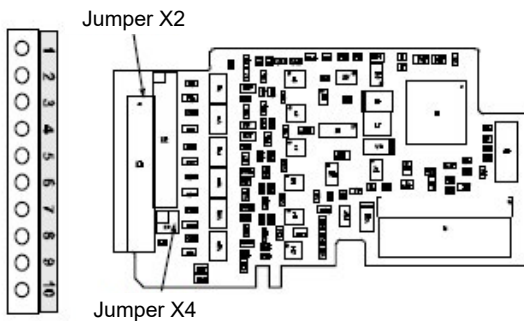


Fig. 9: OPTB1, 6 DI/DO card

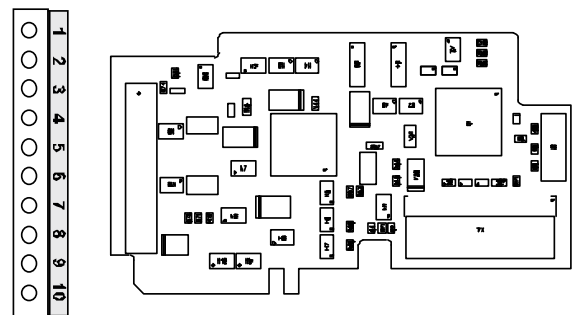


Fig. 10: OPT-B4, 1AI/2AO card

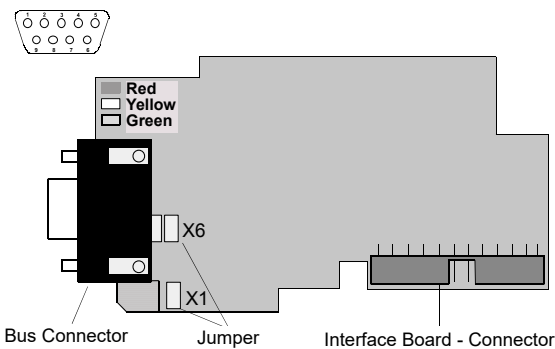


Fig. 11: OPTE5, Profibus card (right slot)

word 1: motor current
word 2: process value
word 3: control value
word 4: PT100 temperature
word 5: motor speed (RPM)
word 6: process reference
word 7: relay output
word 8: output frequency



6" HES System Performance Data 400V-50Hz

400V/50Hz	P _N [kW]	Thrust F [kN]	n _N [min ⁻¹]	I _N [A]	I _A /I _N [*] [A]	η [%]	PF	T _N [Nm]	T _A /T _N [*] [Nm]
308 010 X16	4	15,5	3000	8	1	88	0,95	12,9	1
	5,5	15,5	3000	10	1	89	0,95	17,5	1
	7,5	15,5	3000	13	1	89,5	0,95	23,8	1
308 014 X23	9,3	15,5	3000	18	1	91,5	0,95	29,6	1
	11	15,5	3000	20	1	92	0,95	35	1
308 014 X38	13	15,5	3000	23	1	92,5	0,95	41,5	1
	15	15,5	3000	26	1	92,5	0,95	46,1	1
	18,5	15,5	3000	32	1	92	0,95	59	1
308 016 X61	22	27,5	3000	39	1	93	0,95	70	1
	26	27,5	3000	46	1	92,5	0,95	82,6	1
	30	27,5	3000	54	1	91,5	0,95	95,5	1
308 016 X87	37	27,5	3000	72	1	90	0,95	117,8	1

8" HES System Performance Data 400V-50Hz

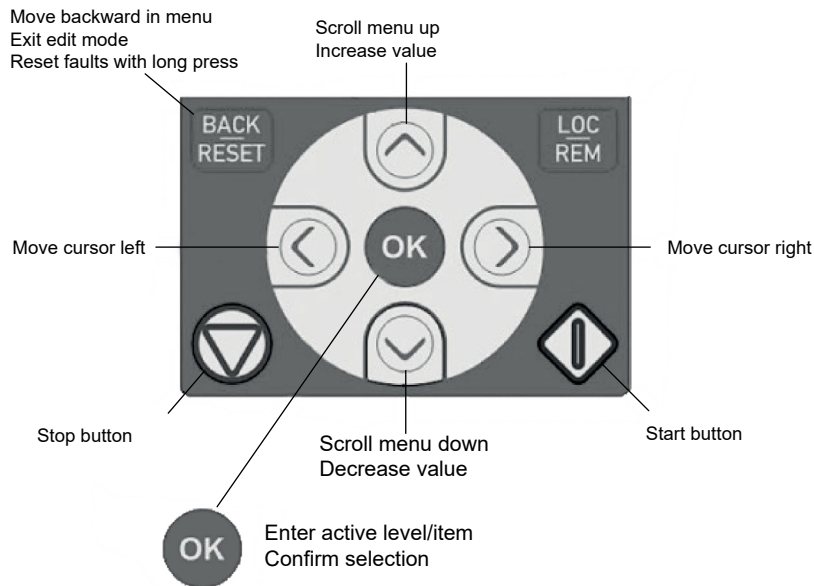
400V/50Hz	P [kW]	Thrust F [kN]	n _N [min ⁻¹]	I _N [A]	I _A /I _N [*] [A]	η [%]	PF	T _N [Nm]	T _A /T _N [*] [Nm]
308 014 X01	45	45	3000	74	1	93,3	0,96	143	1
	55	45	3000	91	1	93,3	0,96	175	1
	67	45	3000	112	1	93	0,96	213	1
	75	45	3000	128	1	92,5	0,96	239	1
308 016 X01	75	45	3000	129	1	93,5	0,95	239	1
	83	45	3000	143	1	93,3	0,95	264	1
	93	45	3000	162	1	93	0,95	296	1
	100	45	3000	178	1	92,7	0,95	319	1
308 017 X01	100	45	3000	176	1	94,2	0,94	319	1
	110	45	3000	193	1	94,2	0,94	350	1
	130	45	3000	229	1	94	0,94	413	1
	150	45	3000	270	1	93,4	0,94	477	1

Performance data are based on measurements with Franklin Electric original equipment!

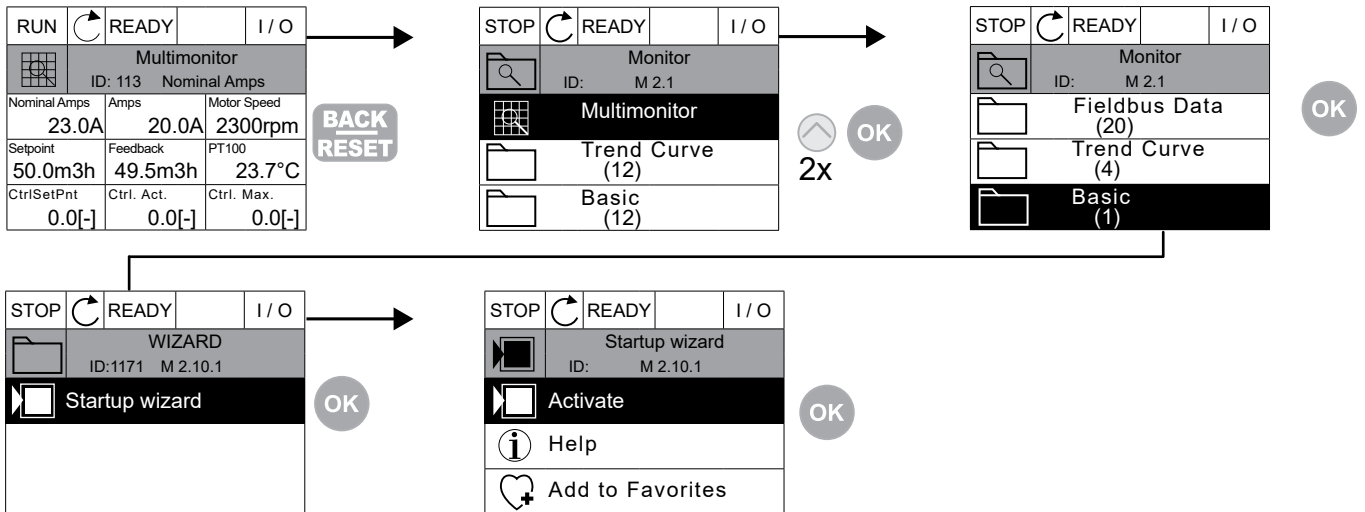
*Since this is an integrated system (motor plus electronics) these figures relate to VFD input



Keypad buttons Overview

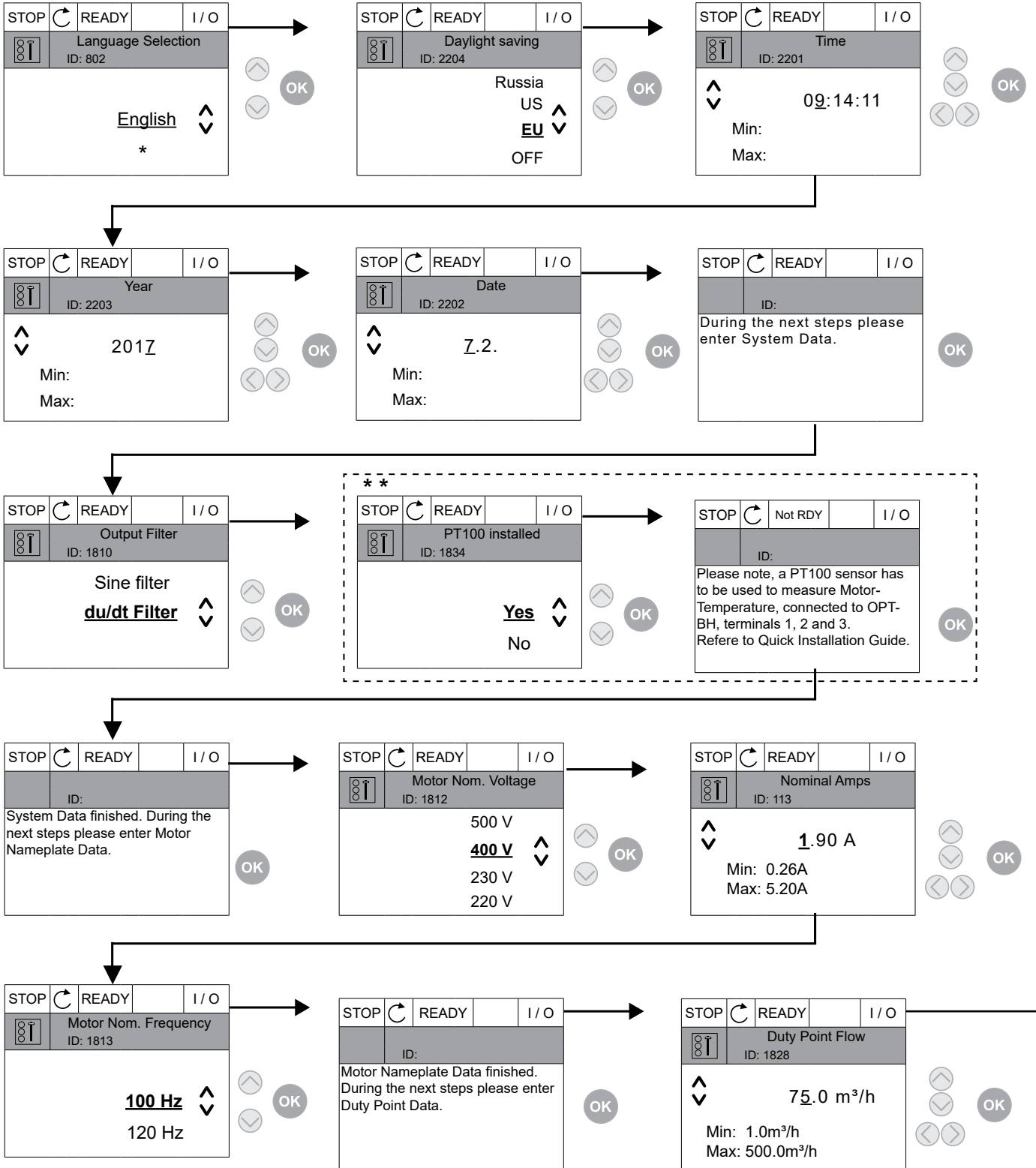


Start-Up-Wizard





Basic Configuration



* for other languages please contact Franklin Electric Europa GmbH

** is only shown and selectable if PT100 Option card is installed



Basic Configuration

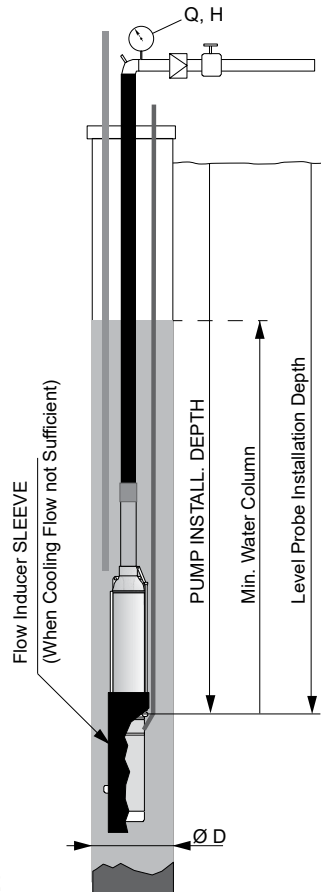
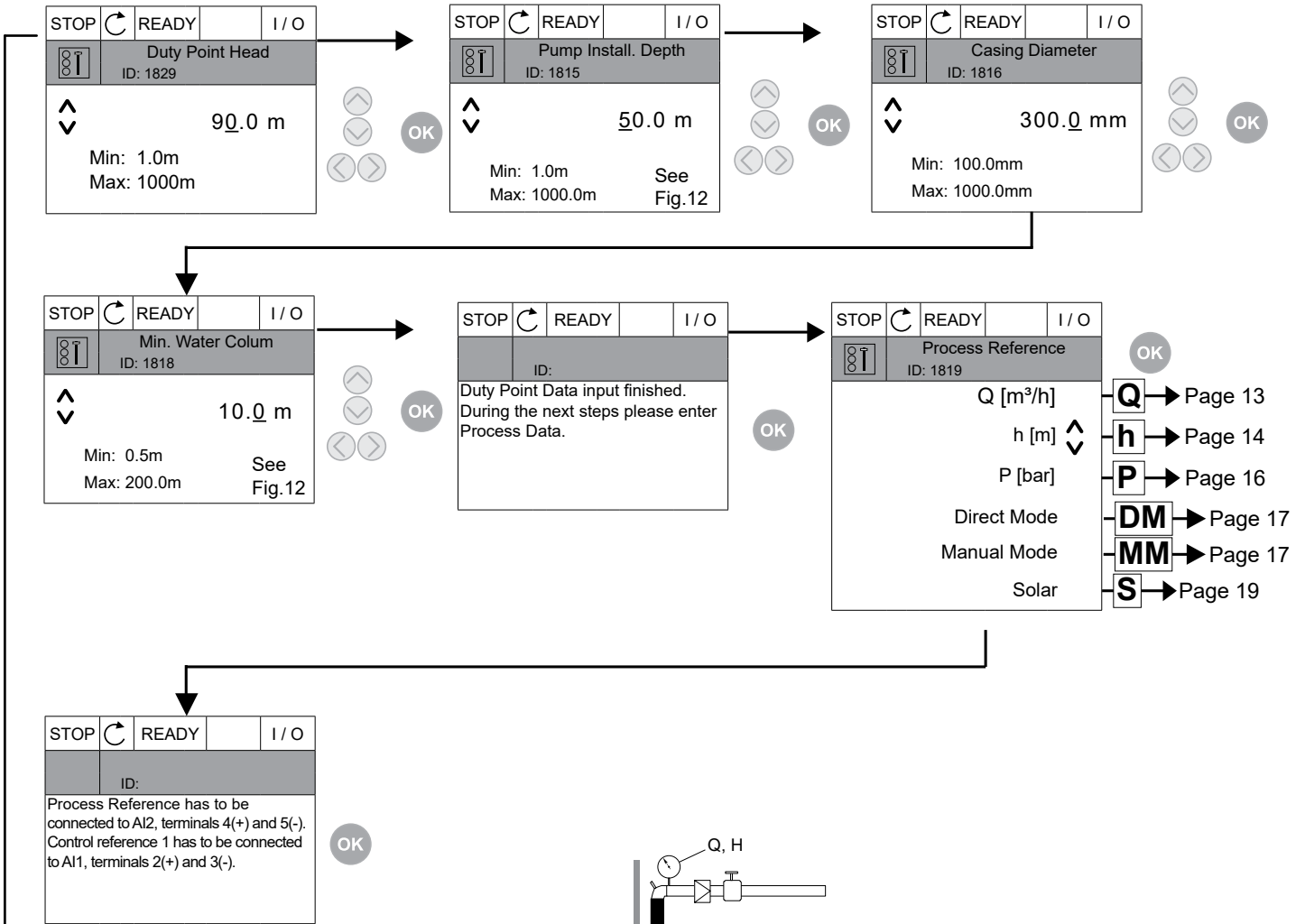
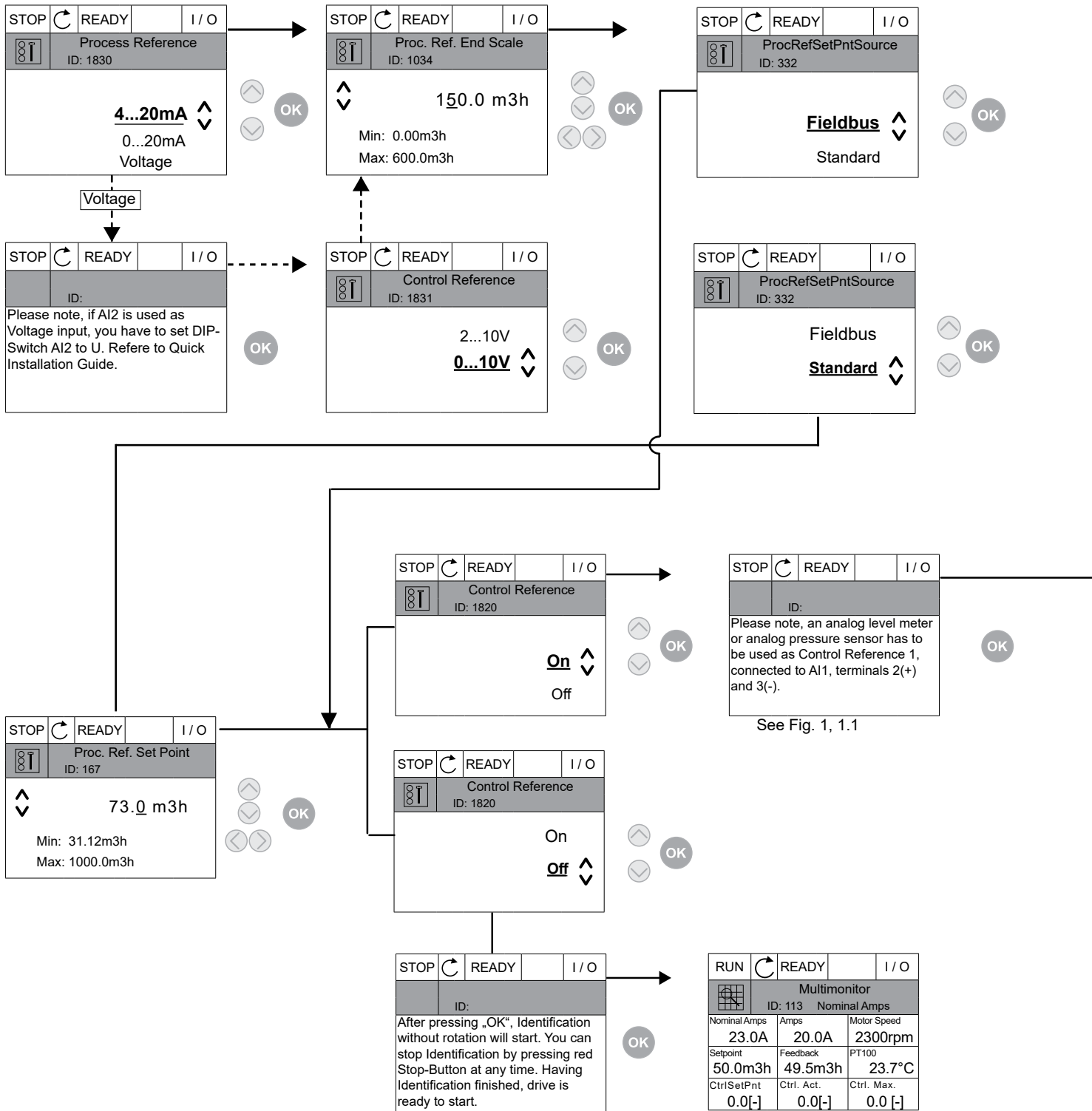
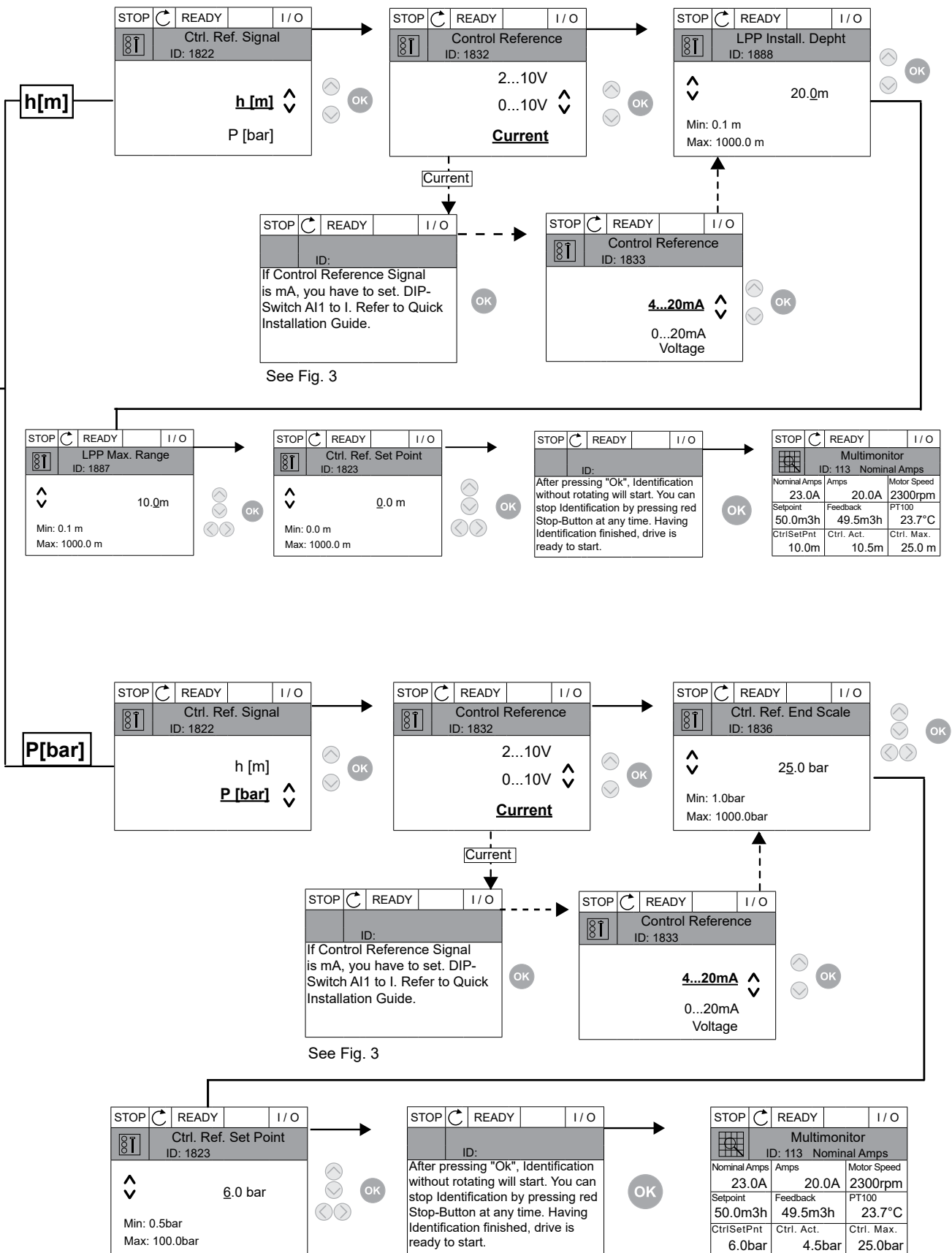


Fig. 12

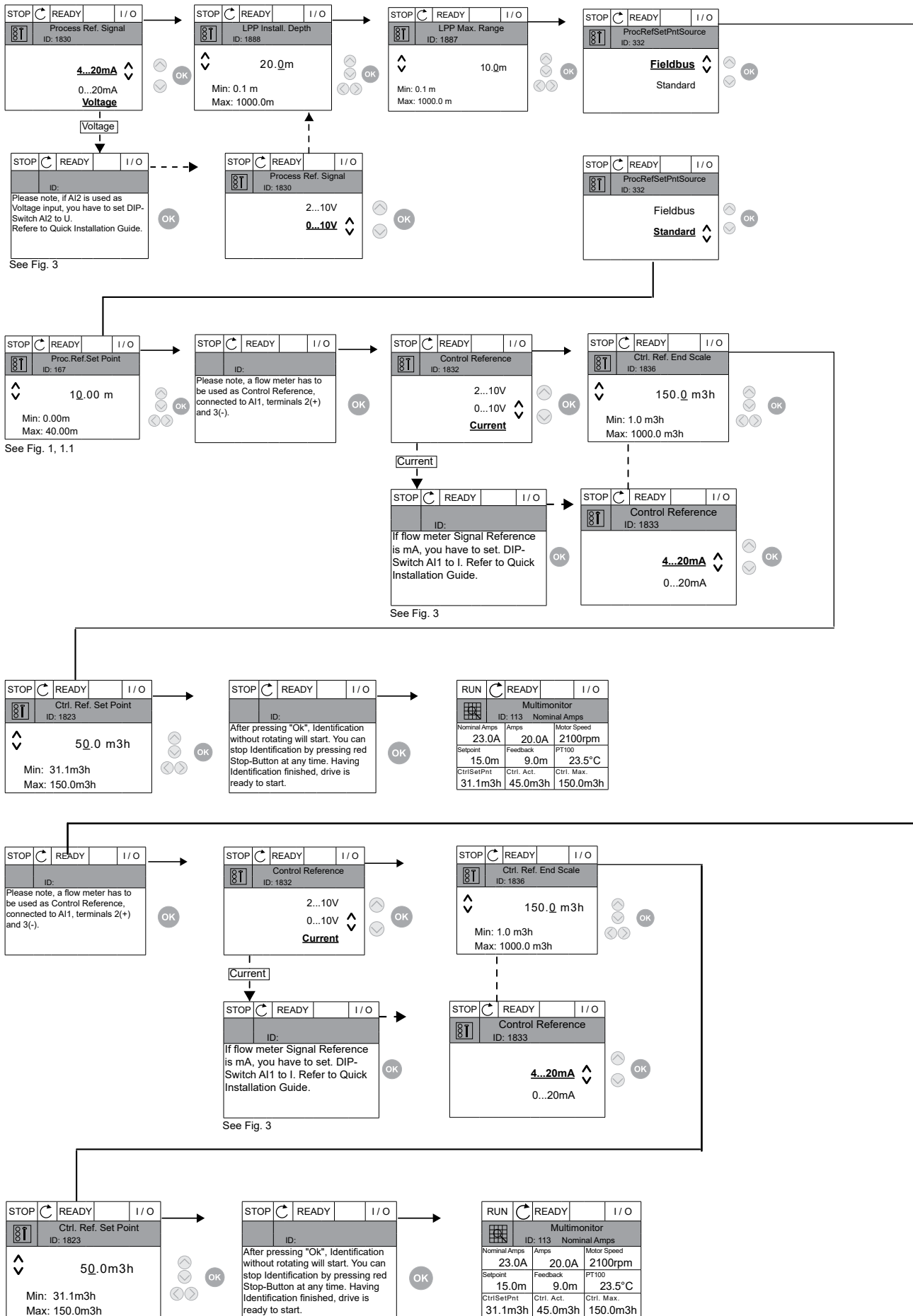
Configuration Q [m³/h]



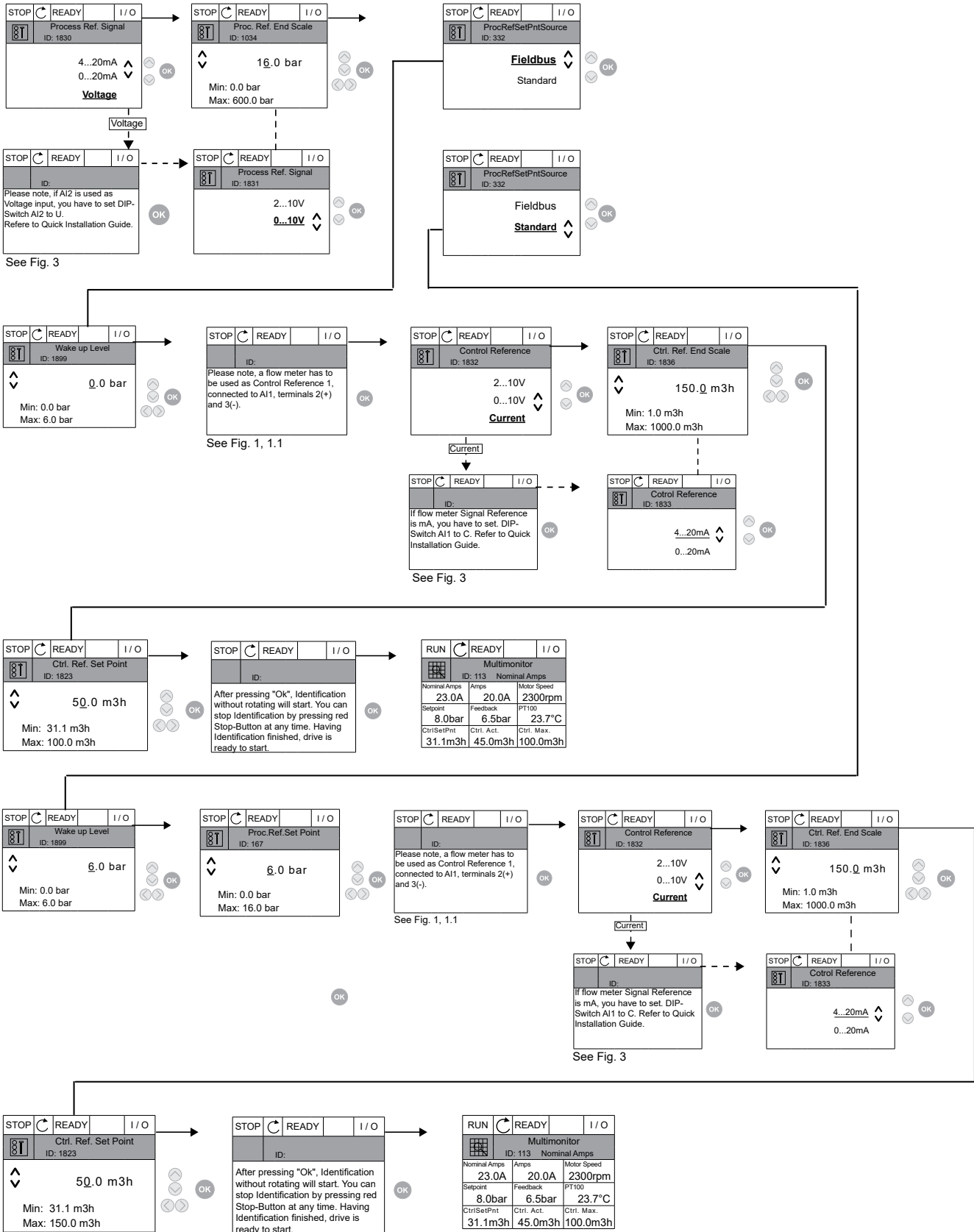
Configuration Q [m³/h]



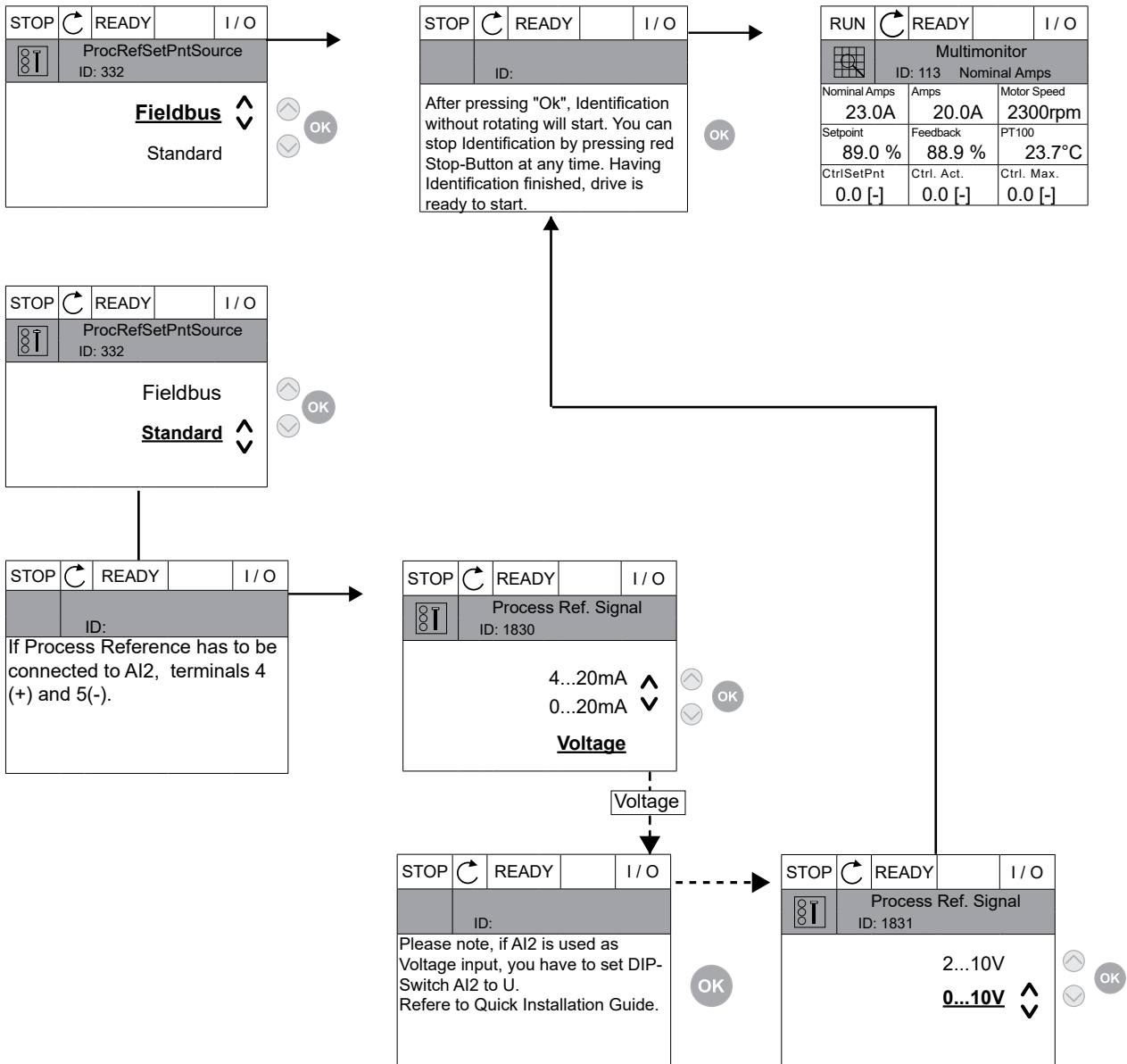
Configuration h [m]



Configuration P [bar]

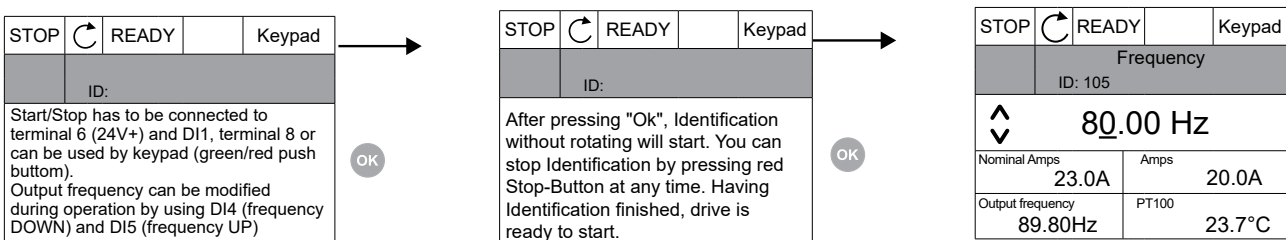


Configuration Direct Mode (DM)



See Fig. 3

Configuration Manual Mode (MM)





Display Messages

Failure Messages

RUN		READY	ALARM	I/O
Sleep				
Alarm Active		Code: 81		
Control Reference Signal out of range. Device is sleeping.				

STOP		READY	ALARM	I/O
Identification				
Alarm Hold		Code: 57		
Cause: Identification run has failed Remedy: Check that motor is connected to frequency converter and Run command will not be removed before completion of identification run.				

RUN		READY	ALARM	I/O
PT100 Temperature				
Alarm Active		Code: 70		
Motor temperature critical. Device sleep imminent.				

RUN		READY	ALARM	I/O
PT100 Temperature				
Alarm Active		Code: 70		
Motor temperature critical. Device is sleeping.				

STOP		READY	ALARM	I/O
Sleep				
Alarm Active		Code: 81		
Process Reference Signal too low. Device is sleeping.				

		READY	ALARM	I/O
Sleep				
Alarm Active		Code: 81		
Process Reference Set Point not reached for a period of time. Device is sleeping.				

STOP		READY	ALARM	I/O
Sleep				
Alarm Active		Code: 81		
Process Reference Signal not reached during a period of time.				

		READY	ALARM	I/O
Sleep				
Alarm Active		Code: 81		
Control Reference Signal out of range. Device is sleeping.				

STOP		READY	ALARM	I/O
Sleep				
Alarm Active		Code: 81		
Control Reference Signal out of range for several times.				

		READY	ALARM	I/O
Sleep				
Alarm Active		Code: 81		
Level switch Empty and Full have not plausible switch settings.				

Warning

		READY		I/O
ID:				
Next Start-Delay active. Please wait, drive will start automatically.				

		READY		I/O
ID: 1081				
Too high Process Reference at low speed for a period of time.				

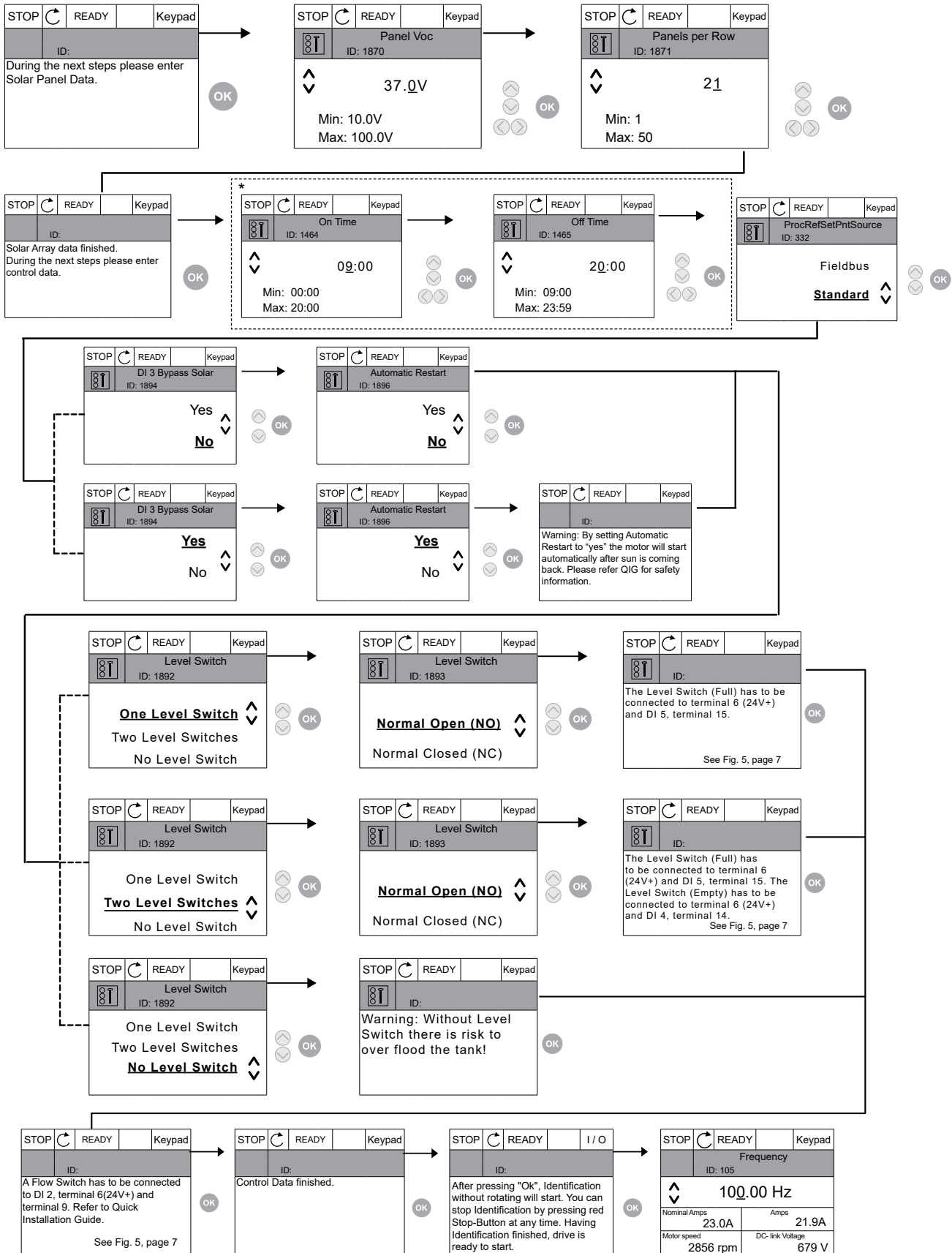
Faults

STOP		Fault		I/O
Current Limit				
Fault: Hold		Code: 82		
Motorcurrent reached Current-Limit. Check Setting and Pump.				

STOP		Fault		Keypad
! Current Limit				
Fault: Hold		Code: 83		
Output frequency lower than minimum frequency.				

Configuration 6" HES Solar (S)

(Attention: The final start-up has to be done under sufficient irradiation condition (800W/m2)!)



* According to software revision

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