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6" / 8" HES

Quick Installation Guide





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6" / 8" HES

Quick Installation Guide



Summary

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Additional safety instructions



DANGER

System can automatically restart (Solar) - the appropriate safety precautions should be taken. See page 19



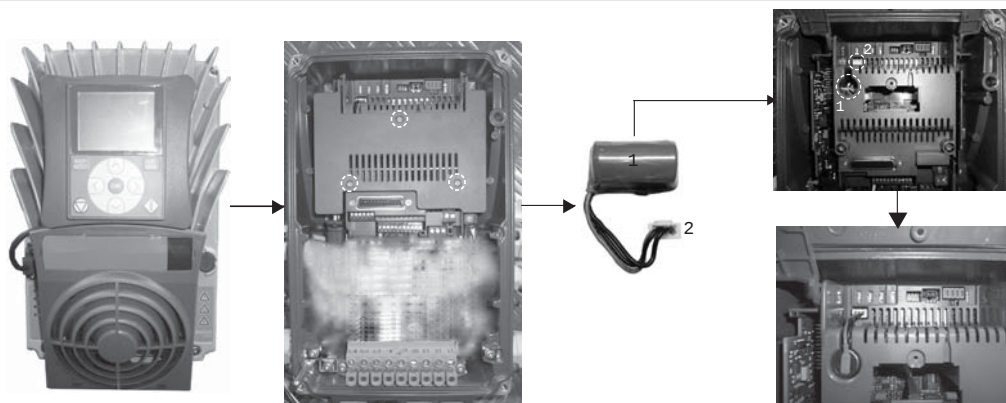
Control modes and necessary sensor technologies

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		Optional	
	Q	mandatory	mandatory			
	H		mandatory	mandatory		
H - level	No (Optional)	Yes*		mandatory	Optional	
	Q	mandatory		mandatory		
	P		mandatory	mandatory		
Direct Mode	No	Yes**	No	No	Optional	No
Manual Mode	No				Yes*	
Solar	No				Yes*	mandatory

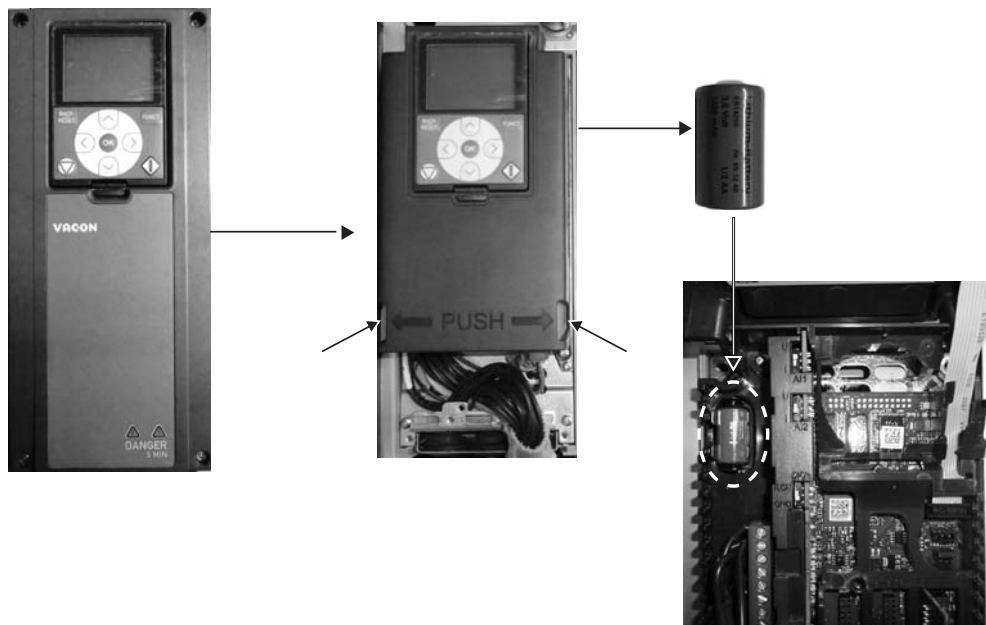
*please consult Franklin Electric

** 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
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
9	DI2	Digital input 2
10	DI3	Digital input 3
11	CM	Common for DI1 - DI6*
12	24V out	24V aux. voltage
13	GND	I/O ground
14	DI4	Digital input 4
15	DI5	Digital input 5
16	DI6	Digital input 6
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

Control Reference: (Connection depending on settings)	AI1, Terminals 2(+), 3(GND) Default setting [V]
Process Reference:	AI2, Terminals 4(+), 5(GND) Default setting [mA]
Start/Stop:	DI1, Terminals 6(+24V), 8(DI1)
External Fault:	DI2, Terminals 6(+24V), 9(DI2)
Manual Operation:	DI3, Terminals 6(+24V), 10(DI3)
Set Point - :	DI4, Terminals 6(+24V), 14(DI4)
Set Point + :	DI5, Terminals 6(+24V), 15(DI5)
Reset:	DI6, Terminals 6(+24V), 16(DI6)

* Can be isolated from ground, see chapter 5.1.6.

Fig. 1: Input/Output Terminals

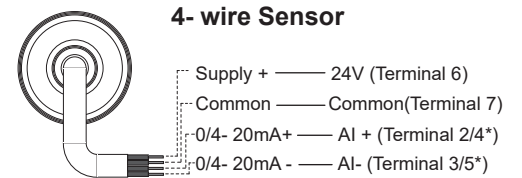
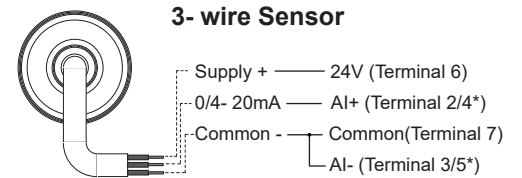
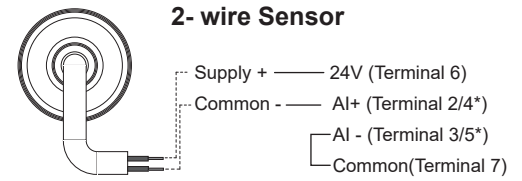


Fig. 1.1 : Sensor connection
* depending on Reference

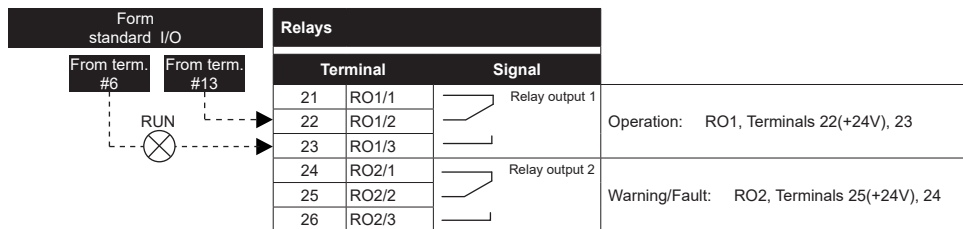


Fig. 2: Relais Output Connection

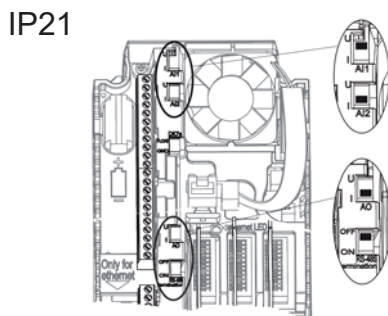


Fig. 3: Analog Input/Output Signal Selection

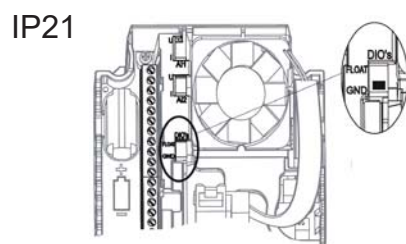
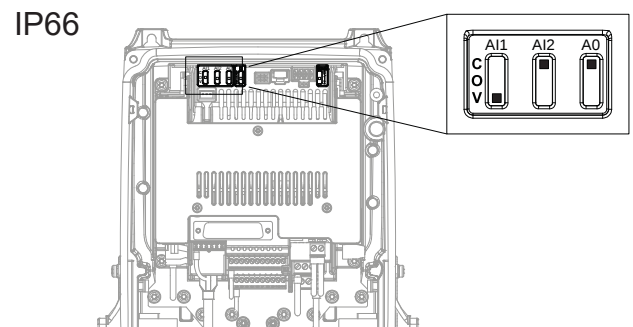
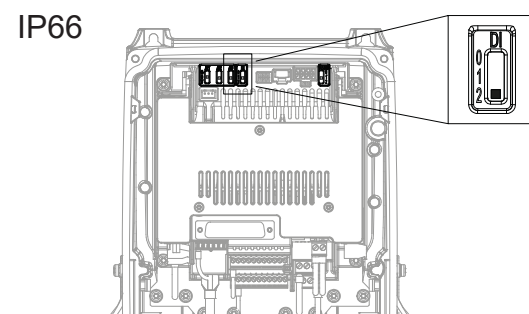
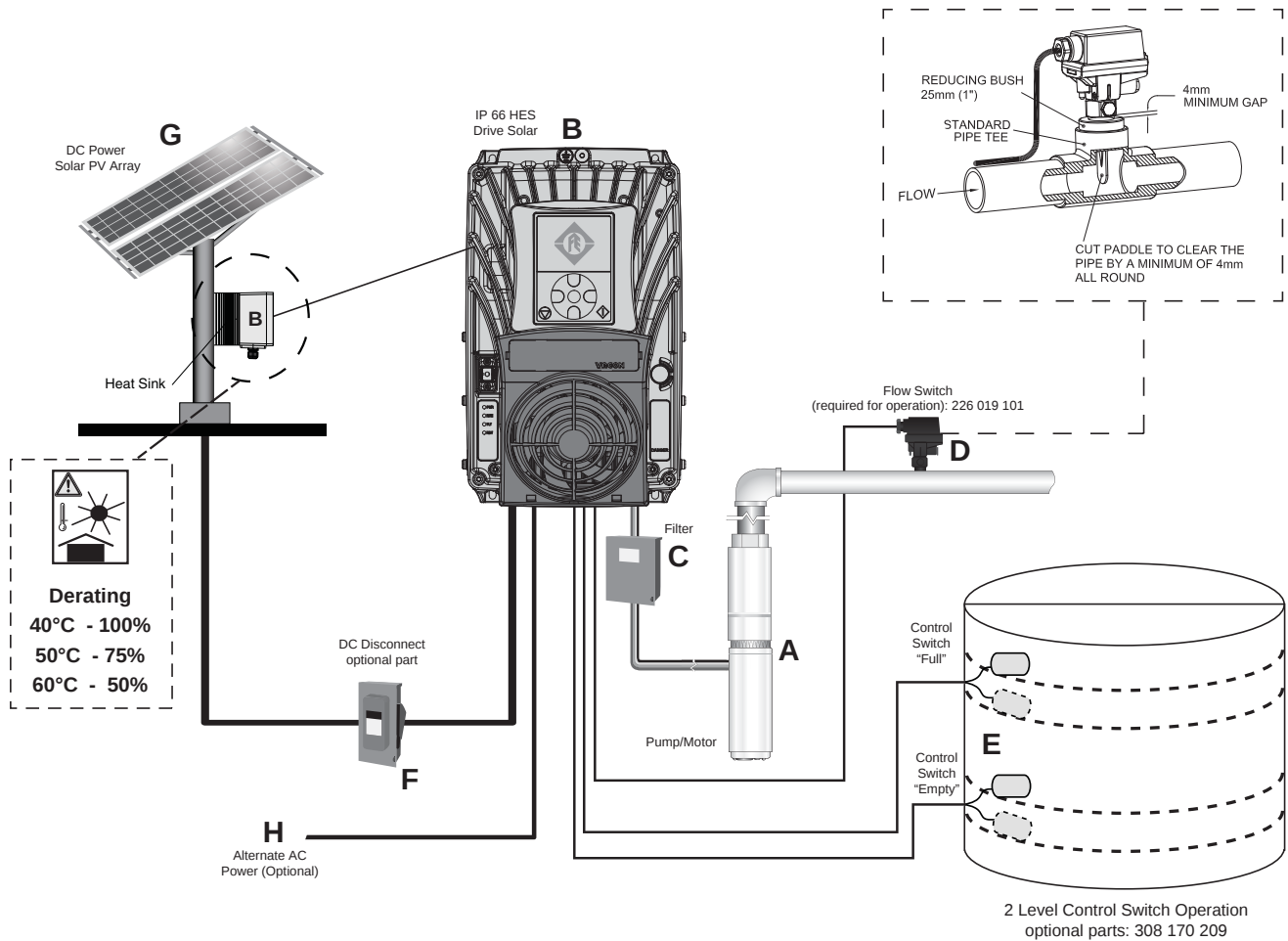


Fig. 4: Digital Input Selection





6" HES Solar System



Connections 6" HES Solar System

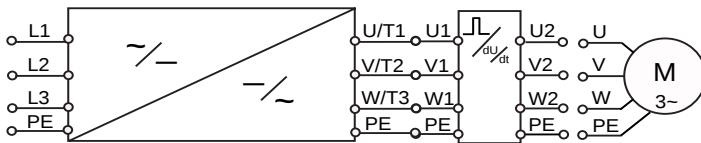
Standard I/O			
Terminal	Signal		
1	+10 Vref	Reference output	
2	AI1+	Analogue input, voltage or current	
3	AI1-	Analogue input common	
4	AI2+	Analogue input, voltage or current	
5	AI2-	Analogue input common	
6	24V out	24V aux. voltage	
7	GND	I/O ground	
8	DI1	Digital input 1	Start/Stop: DI1, Terminals 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

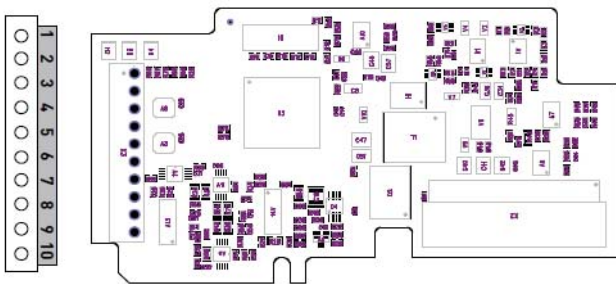


Fig. 7: PT100 card (left slot)

Color code FE PT100 Lead:

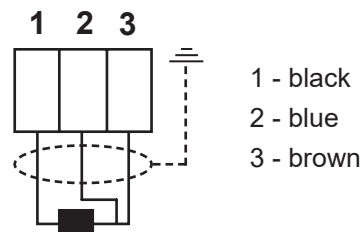


Fig. 8: PT100 connection

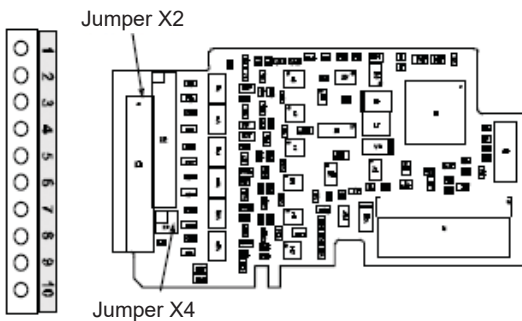


Fig. 9: OPTB1, 6 DI/DO card

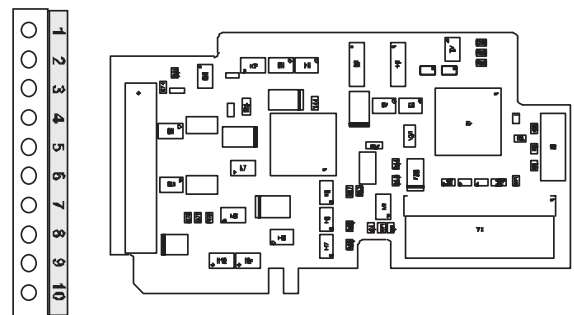


Fig. 10: OPT-B4, 1AI/2AO card

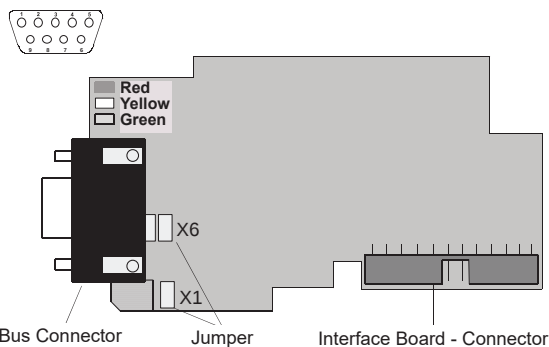


Fig. 11: OPTE5, Profibus card (right slot)

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 [%]	cos φ [%]	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

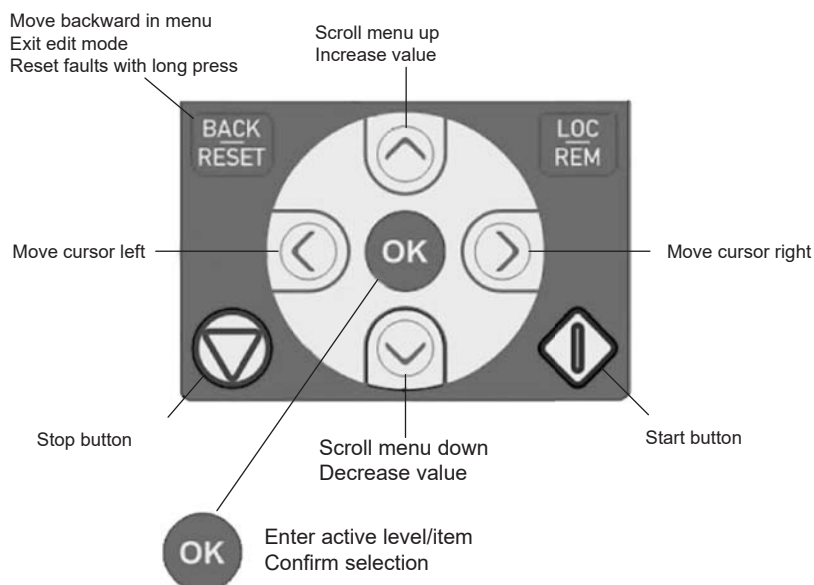
400V/50Hz	P [kW]	Thrust F [kN]	n _N [min ⁻¹]	I _N [A]	I _A / I _N [*] [A]	η [%]	cos φ [%]	T _N [Nm]	T _A / T _N [*] [Nm]
308 014 X01	45	45	3000	74	1	93,3	0,96	143	1
	55	45	3000	91	1	93,3	0,96	175	1
	67	45	3000	112	1	93	0,96	213	1
	75	45	3000	128	1	92,5	0,96	239	1
308 016 X01	75	45	3000	129	1	93,5	0,95	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!

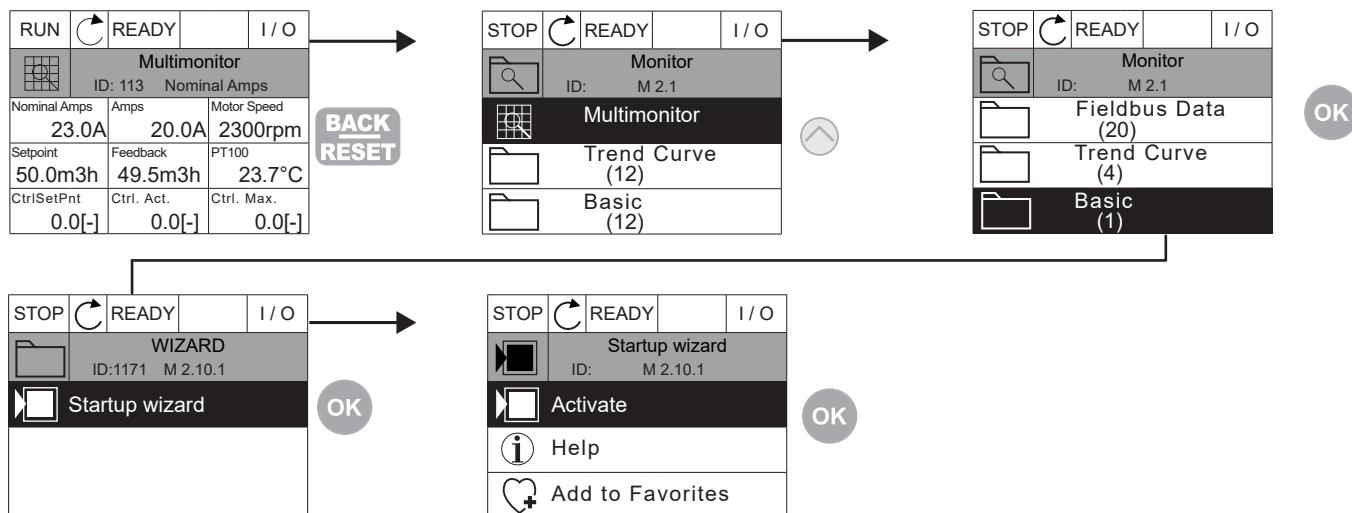
*Since this is an integrated system (motor plus electronics) these figures relate to VFD input



Keypad buttons Overview

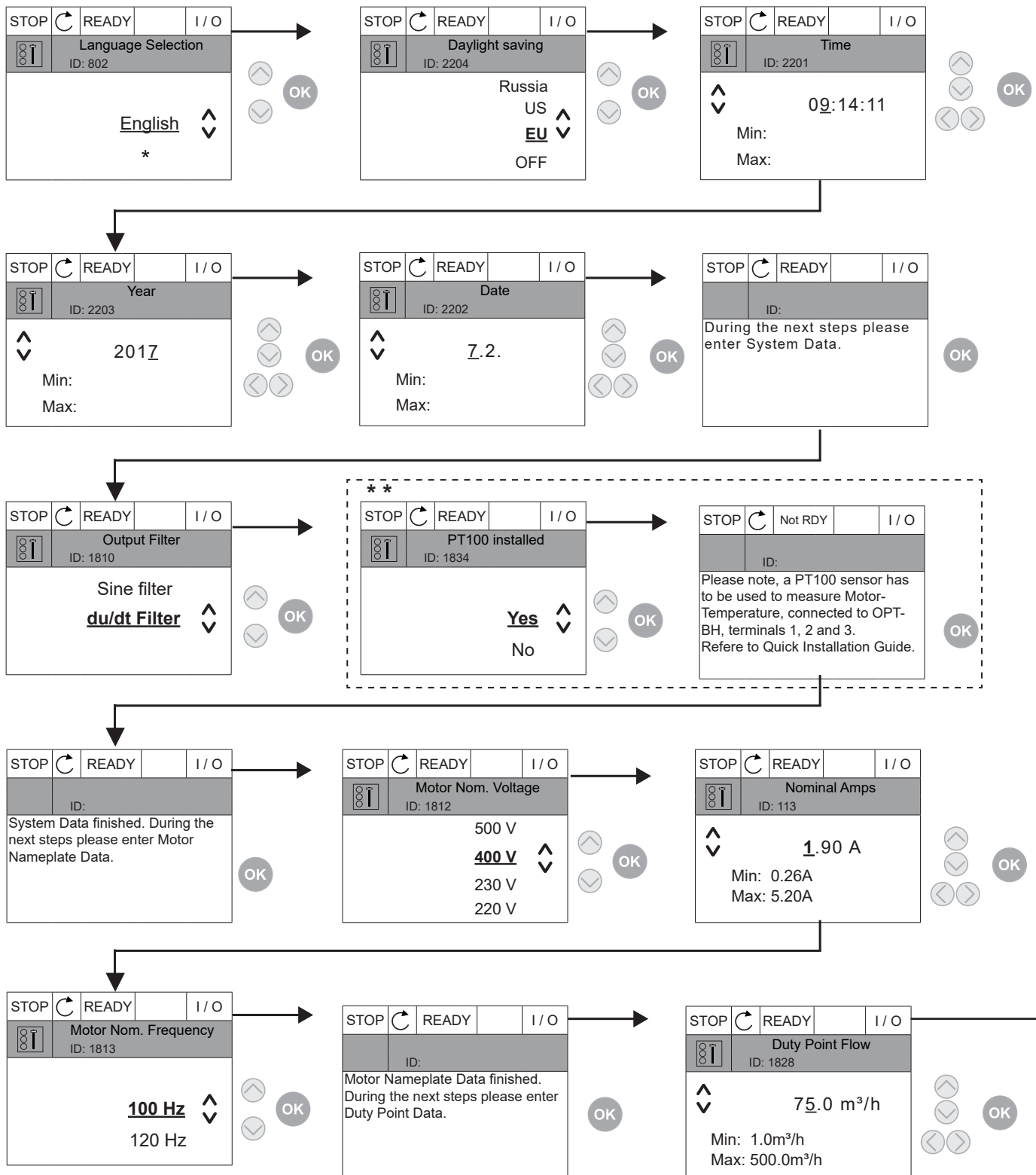


Start-Up-Wizard





Basic Configuration



* for other languages please contact Franklin Electric Europa GmbH

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



Basic Configuration

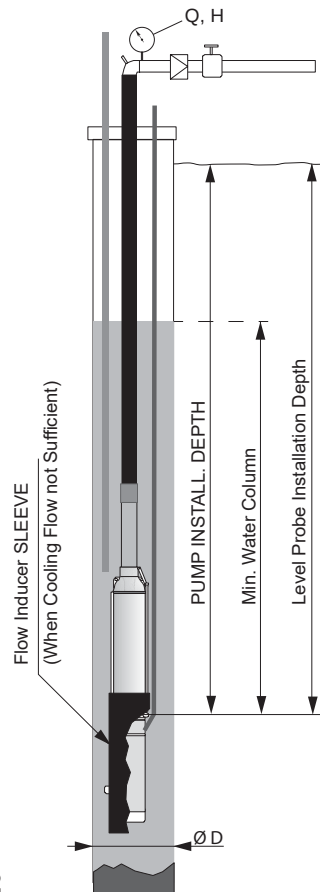
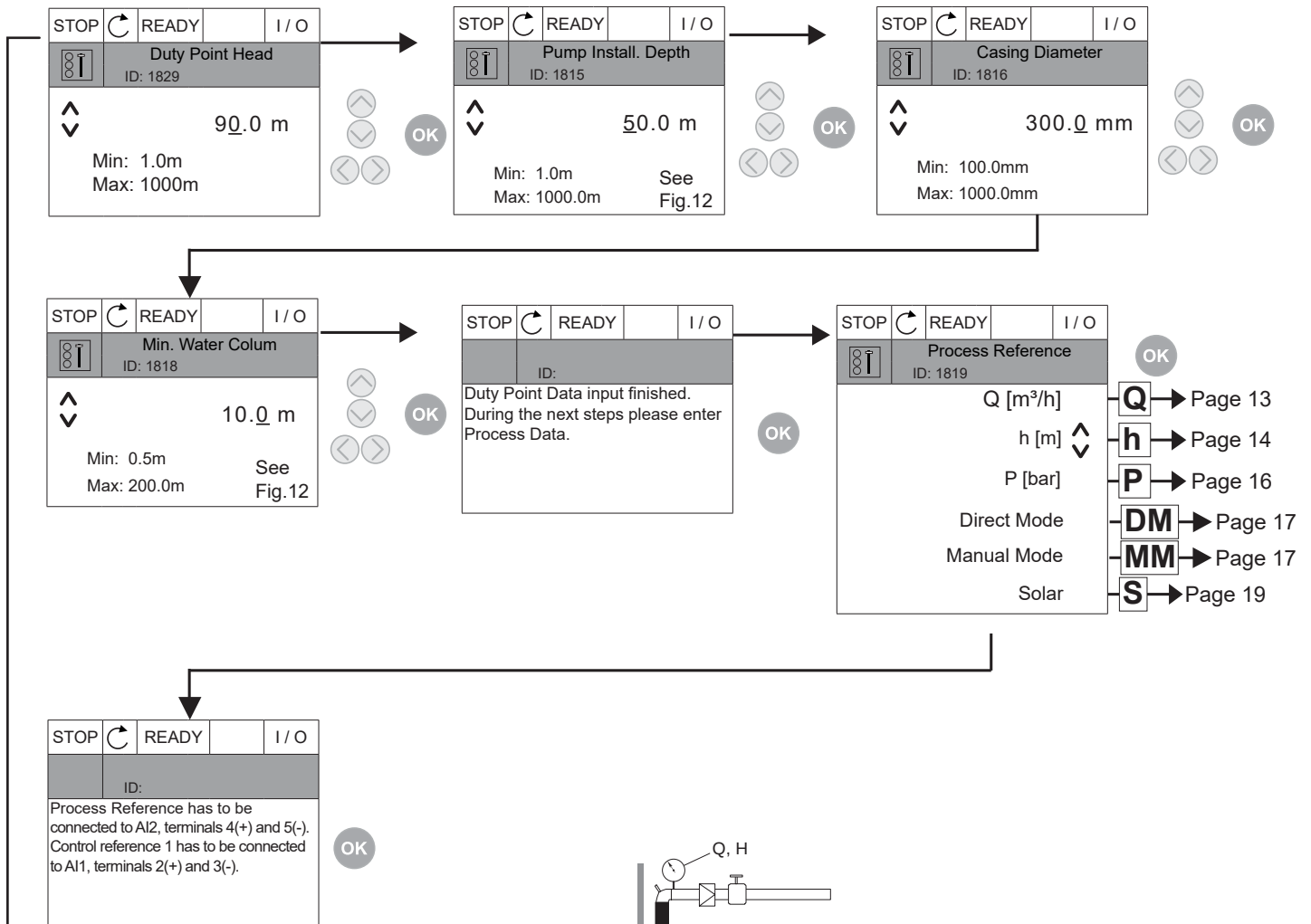
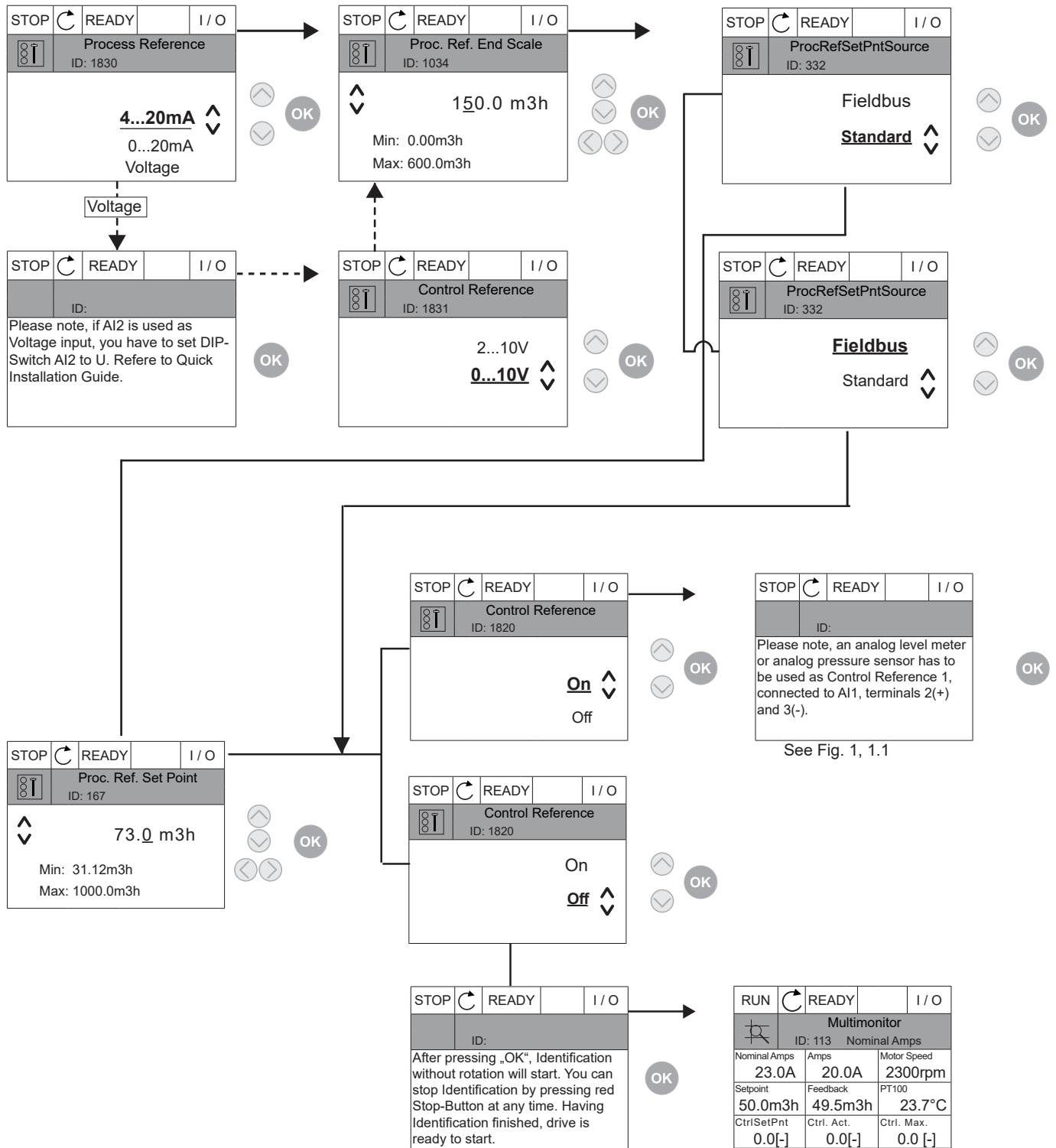


Fig. 12

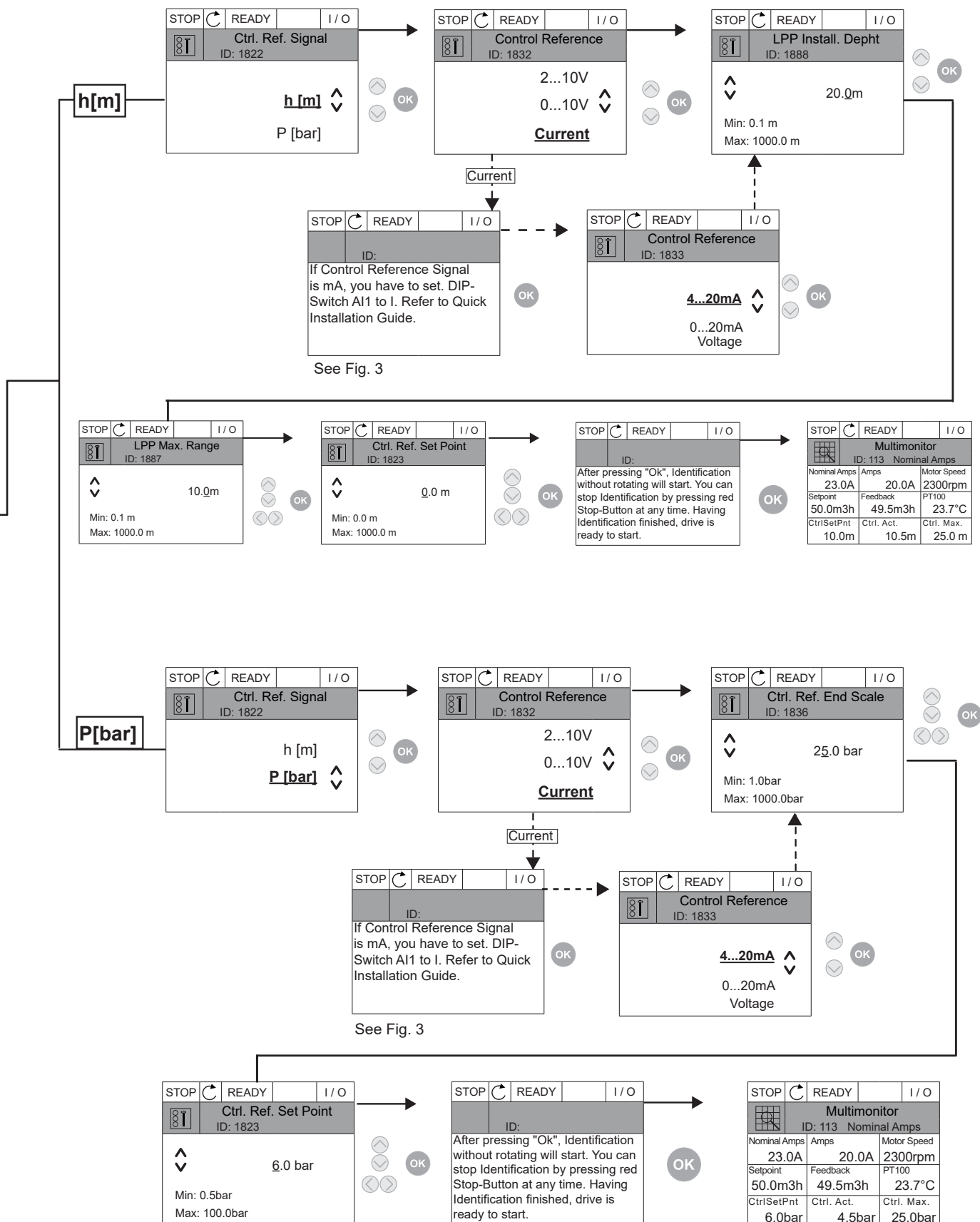


Configuration Q



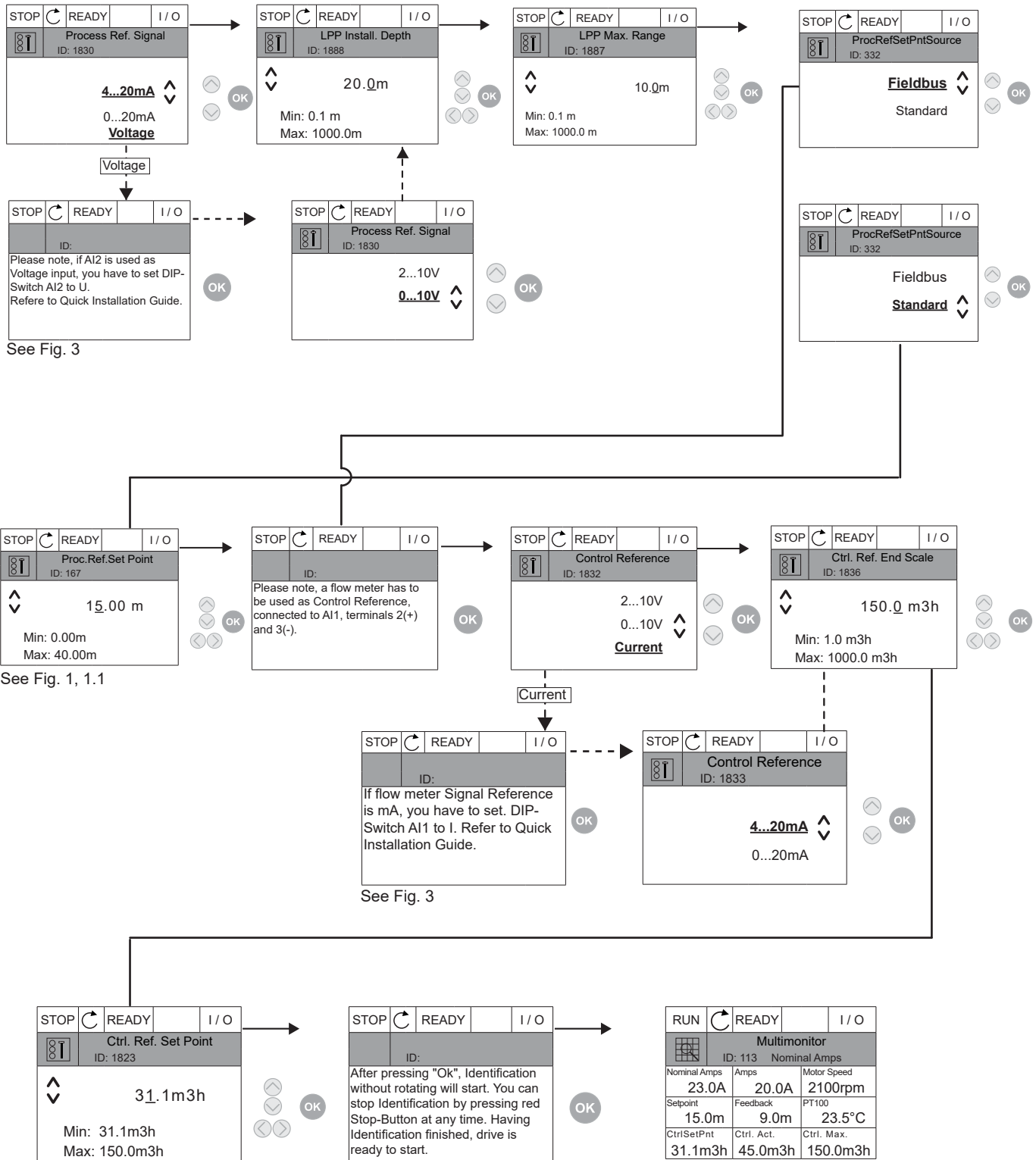


Configuration Q



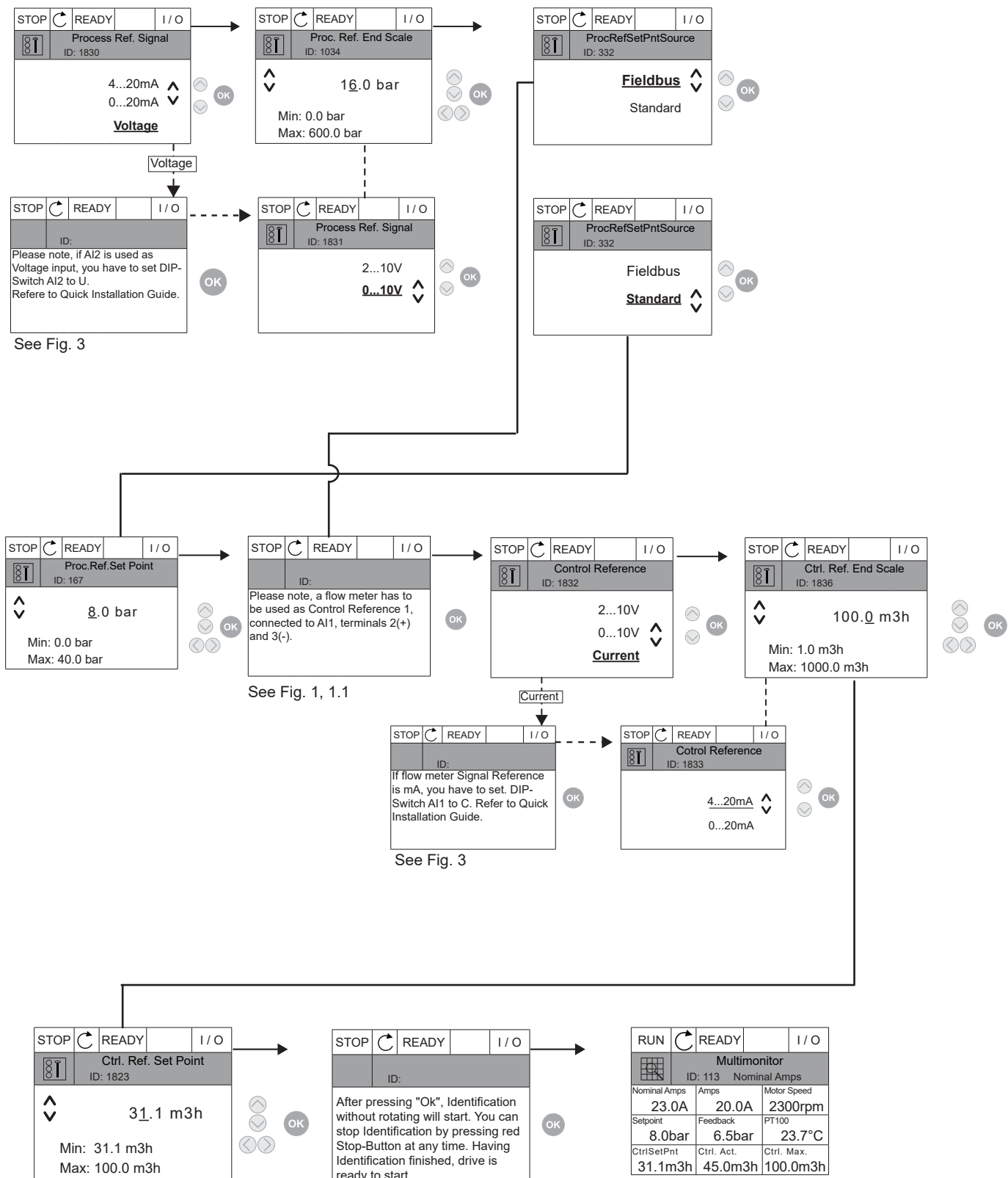


Configuration h



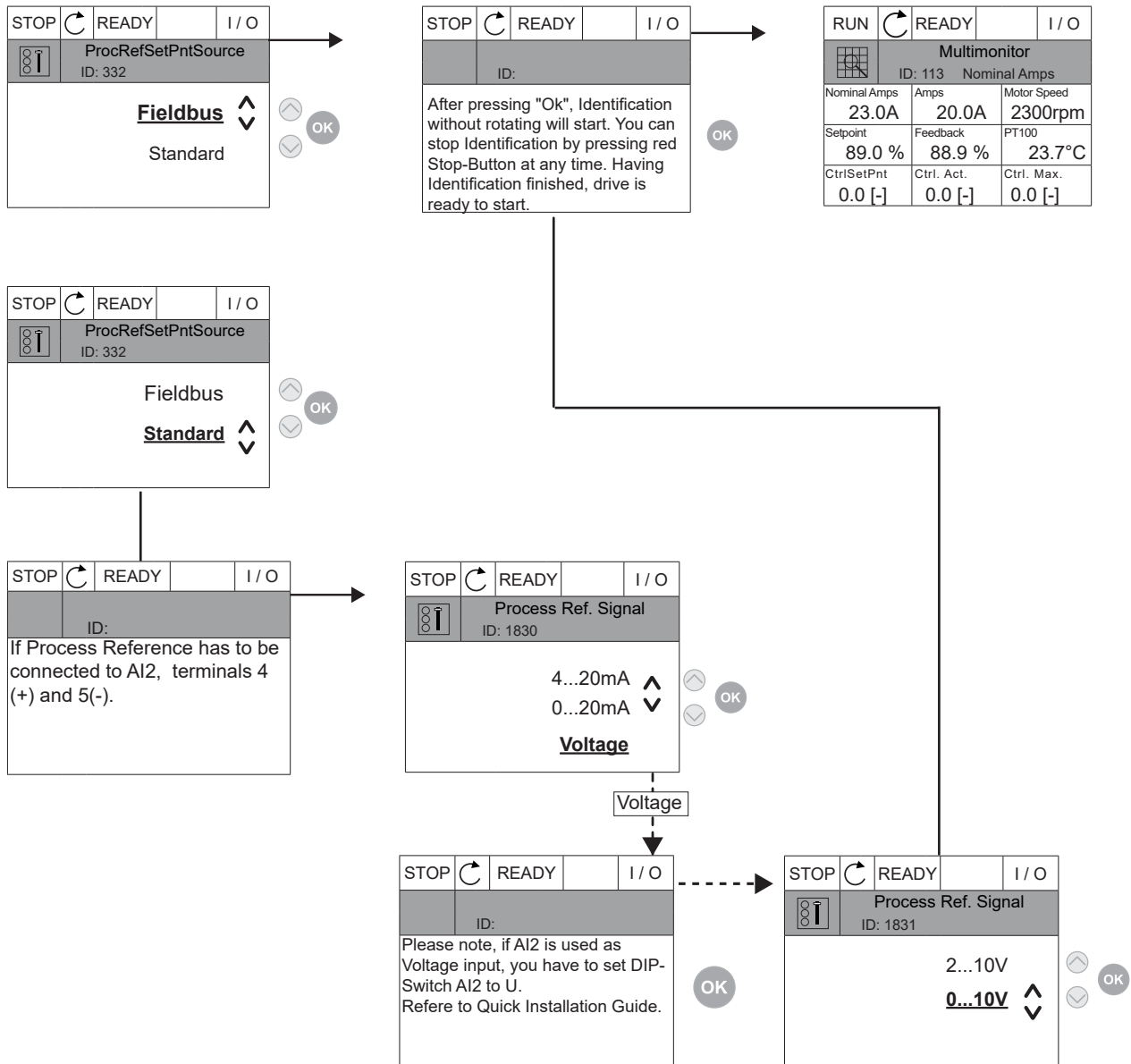


Configuration P



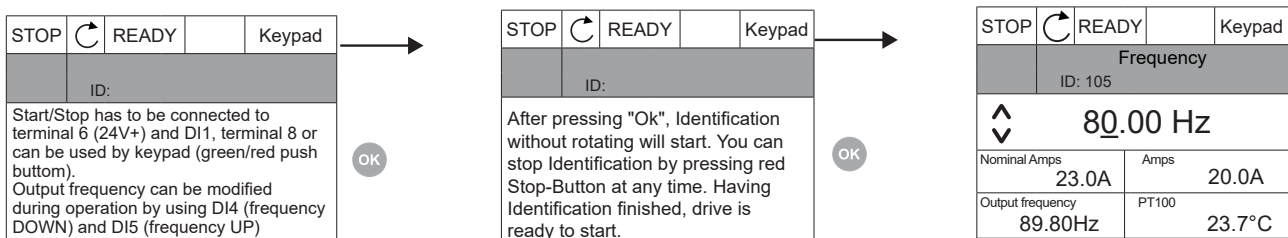


Configuration Direct Mode (DM)



See Fig. 3

Configuration Manual Mode (MM)





Display Messages

Failure Messages

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

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

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

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

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

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

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

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

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

Warning

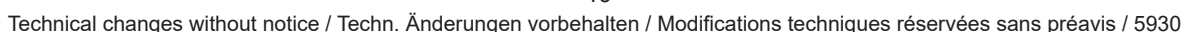
STOP	STOP	READY	ALARM	I/O
ID:				
Next Start-Delay active. Please wait, drive will start automatically.				

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

Faults

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

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



Notes

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This image shows a full page of blank graph paper. The background is a light gray color, and it is covered by a uniform grid of thin, darker gray lines. The grid consists of small squares that extend across the entire area of the page, providing a guide for drawing or writing. There are no margins, text, or other markings on the paper.



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