Separation Unit

Alarms and Fault Finding

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Solutions beyond technology

Alfa Laval

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1 Alarms

1.1 Alarm Functions

The alarm system is designed to ensure a safe separation system.

All alarms are shown on the operator panel display, and most of them are complemented by light emitting diodes (LEDs).

The alarms are displayed in order of occurrence.

1.2 Reading Alarm History List

To read the stored list of alarms, do as follows:

- Push ‘Enter’.
- Push ‘+’ until ‘End’ is shown on the display.
- Push ‘Enter’ and ‘+’ at the same time.
- Push ‘+’ repeatedly until ‘AL list’ shows on the display.
- Push ‘Enter’.
- Go through the list using the ‘+’ pushbutton until ‘End’ shows on the display.
- Push ‘Enter’.
- Push ‘+’ repeatedly until ‘Exit’ shows on the display.
- Push ‘Enter’ to return to normal display.

1.2.1 Alarm message explanation:

The display shows:

Alarm no. 5	Alarm number
Feed pressure low	Type of alarm
0:13	This alarm occured 13 minutes ago.
P1 60	Parameter Pr 1 was set to 60 minutes.
00:02:13	The alarm was reset after 2 minutes 13 seconds.

1.3 Alarm Reset

WARNING

Breakdown hazard

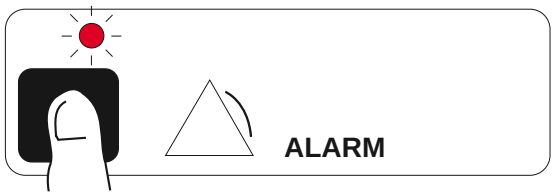
Never reset an alarm without first finding and remedying the cause.

1 Acknowledge the alarm signal by pressing the alarm pushbutton.
The flashing LED then changes to steady shine.

2 Remedy the cause.

3 Reset the alarm function by pressing the alarm pushbutton a second time.

The LED will go out.



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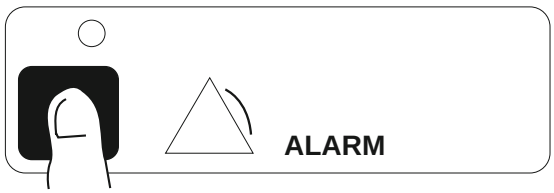

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It is possible to reset the system without remedying the cause, but the alarm signal will be repeated.

NOTE

The STOP sequence is automatically initiated if an alarm is not remedied within 30 minutes.

Risk of injury

Never return to the operator panel to acknowledge or reset an alarm if doing so is by any means hazardous.

1.4 Abnormalities not displayed

There are some abnormalities not shown on the display. Below are listed the most common:

	Why?	What to do
Smell	• Normal occurrence during start while the friction blocks are slipping.	**None.**
	• Oil level in oil sump too low.	**Check oil level and add oil if necessary.**
Noise	• Height position of paring disc is incorrect.	**Stop the separator, measure and adjust the height.**
	• Bearing(s) damaged or worn.	**Renew all bearings.**
	• Improper bowl assembly	**Check and reassemble.**
Unsatisfactory separation result	• Incorrect separation temperature.	**Adjust.**
	• Throughput too high.	**Adjust.**
	• Disc stack is clogged.	**Clean disc stack.**
	• Sludge space in bowl is filled.	**Clean and reduce the time between sludge discharges.**
	• Bowl speed too low.	**Examine the motor and power transmission for correct frequency parts.** **Check belt and coupling pads.**
	• Bowl rotates in wrong direction	**Check the electrical connections to the motor.**

2 Display Alarms and Actions

The display shows	on page
Temperature increase - TOO SLOW	18
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Temperature alarm sensor - ERROR	10
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Transducer value - LOW	16
Vibration board - ERROR	18
Vibration sensor - ERROR	8
Water drain - INSUFFICIENT	17
Water drain pressure - HIGH	17
Water pressure sensor PT5 - ERROR	15

The display shows	Why?	What to do
Lockswitch - FAILURE	• Separator not mounted as described in the *Service Manual* booklet.	**Mount the separator according to the instructions in the *Service Manual* booklet.** NOTE **The cause of this alarm must be remedied within 30 minutes. If not, the STOP sequence will begin.**
High vibration - SHUTDOWN WARNING Disintegration hazards **If excessive vibration occurs, stop separator and keep bowl filled with liquid during rundown.** **The cause of the vibration must be identified and corrected before the separator is restarted.**	• Sludge remaining in part of the bowl	**Dismantle, clean and check the bowl before restart. See Service Manual.** WARNING Disintegration hazard **The separator bowl must be manually cleaned before starting up again.**
	• Bowl wrongly mounted • Disc stack compression incorrect • Bowl assembled with parts from other separators	**Check assembly. See Service Manual.**
	• Height position of paring disc is incorrect.	**Stop the separator, measure and if necessary adjust the height.**
	• Bowl spindle bent.	**Renew the bowl spindle.**
	• Bearing(s) damaged or worn.	**Renew all bearings.**
	• The frame feet are worn out.	**Renew the frame feet.**
	• Spindle top bearing spring broken.	**Renew all springs.**

The display shows	Why?	What to do
High vibration - WARNING	• Sludge remaining in part of the bowl	**Dismantle, clean and check the bowl before restart.**  Disintegration hazard **The separator bowl must be manually cleaned before starting up again.**
	• Bowl wrongly mounted • Disc stack compression incorrect • Bowl assembled with parts from other separators	**Check assembly. See Service Manual.**
	• Height position of paring disc is incorrect.	**Stop the separator, measure and if necessary adjust the height.**
	• Bowl spindle bent.	**Renew the bowl spindle.**
	• Bearing(s) damaged or worn.	**Renew all bearings.**
	• The frame feet are worn out.	**Renew the frame feet.**
	• Spindle top bearing spring broken.	**Renew all springs.**
Vibration sensor - ERROR	• Sensor or cable damaged	**Replace sensor. If no spare sensor available, set parameter Fa 16 = 0.0 to be able to run the system.** **Note that it is not possible to run in AUTO mode.**

The display shows	Why?	What to do
Emergency stop - BUTTON PUSHED	• Emergency button pushed	**Remedy cause for pushing button.** **Reset pushbutton.**
Oil feed temperature - HIGHxxxxx	• Steam supply valve faulty	**Investigate cause and remedy.**
	• Faulty triac module(s) in the power unit or faulty controller in the control unit. (electric heater)	**If relay K11 is on:** **Disconnect X12:10.** **If the temperature is falling, replace the control module in the control unit.** **If the temperature is not falling, replace the triac module(s).** **If relay K11 is off, but contactor K12, K16, or K17 is on, and the temperature is not falling:** **Check if power is supplied from the control unit to the contactor which is on (X12:6 – X12:12, X12:7 – X12:12 , X12:9 – X12:12). If it is, replace the control module in the control unit.**
	• Broken wiring or defective heater resistance, or faulty controller in the control unit.	**Check adjustment of P and I functions in the control unit.** **If contactor sequence correct:** **Check wiring and heater resistance of each block or heater element. See EHM heater component booklet.** **If contactor sequence not correct:** **Replace the control module in the control unit.**

The display shows	Why?	What to do
Oil feed temperature - LOWxxxxx	• Heater clogged • Steam supply insufficient • Steam trap faulty • Steam supply valve faulty	**Investigate cause and remedy.**
	• Faulty fuses or burned contactors (electric heater)	**Check and renew broken fuses. Reset overcurrent protection (applicable for 8/7 – 24/22 kW power unit).** **Check wiring and contactor coils.**
	• Broken wiring or defective heater resistance (electric heater)	**Check wiring and heater resistance of each block or heater element. See the *Service Manual* booklet.**
Temperature alarm sensor - ERROR	• Short circuit / broken sensor or cable.	**Disconnect cable at sensor. Measure resistance between 1-3. Resistance shall be within 100-142 ohms = 0-110 C / 32-230 F.** **Test of EPC 50 input: disconnect cables from sensor, (terminal X 5:1-2-3) and move jumpers Xj1 and Xj2 upwards. Indication within 50-60 C when OK. If no spare sensor available set parameter Pr 16 = 0, or if control sensor free, move connection to that one.**

The display shows	Why?	What to do
Temperature control sensor - ERROR	• Short circuit / broken sensor or cable.	**Disconnect cable at sensor. Measure resistance between 1-3. Resistance shall be within 100-142 ohms = 0-110 C / 32-230 F. If no spare sensor available set parameter Pr 18 = 0. Heater is then out of function.**
Feed flow PT1 - ERROR DURING Tixx	• Pump not working • Pressure in feed line too low	**Check pump.** **Check feed line.**
Bowl speed - HIGH xxxxx	• High power (net) frequency	**Check power supply before restart.**
	• Incorrect transmission parts (50 Hz belt pulley and belt for 60 Hz power supply).	 Disintegration hazard **Stop and change the belt transmission to suit the power supply frequency.**

The display shows	Why?	What to do
Bowl speed - LOW xxxxx	• Slipping belt	**Change belt.**
	• Worn coupling pads	**Check / change pads.**
	• Bowl not properly closed	**Check closing water supply (valve SV 16).** **Check bowl operating system for leakage.** **Check nozzle.**
	• Bowl not properly assembled	**Check that the lock ring is in place.**
	• Low power net frequency	**Check power.**
	• Motor failure.	**Repair the motor.**
	• Bearing(s) damaged.	**Renew all bearings.**
	• Incorrect transmission parts (60 Hz belt pulley and belt for 50 Hz power supply).	 Disintegration hazard **Stop and change the belt transmission to suit the power supply frequency.**

The display shows	Why?	What to do
Bowl speed sensor - ERROR	• Sensor or cable damaged	**Replace sensor. If no spare sensor available set parameter Fa 10=0 to be able to run the system. Note that it is not possible to run in AUTO mode.**
Separator motor - FAILURE	• Feedback signal from contactor K 2 missing	**Check the contactor function. Input terminal X 6:5 in EPC 50.**
OIL LEAKING FROM BOWL	• Bowl periphery sealing damaged	**Change seal ring in bowl hood.** **Check/change rubber rings and valve plugs.**
	• Leakage somewhere in oil outlet	**Check for leakage.**
	• Closing water leaking	**Check/change sealings and plugs.**
NO SLUDGE LEVEL SIGNAL	• No response from level switch in sludge tank after discharge or after draining	**Check the float function. Input terminal X 6:7-X40 in EPC 50.**
	• Level switch faulty	**Repair/replace switch**
Sludge tank level - HIGH	• Pump has not drained the tank	**Check the pump function.**
Oil backpressure PT4 - HIGH	• Increased throughput	**Check. Reduce backpressure.**
	• Regulating valve too restricted	**Adjust valve**

The display shows	Why?	What to do
Oil backpressure PT4 - LOW	• Decreased throughput	**Check feed pump and adjust flow.**
	• Regulating valve open too much	**Adjust valve**
	• Change over valve V1 in recirculation position	**Check air pressure, solenoid valve SV1 and output from EPC 50 terminal X 8:1-X 41.**
	Bowl opens unintentionally during operation because: • Strainer in the operating water supply is clogged.	**Clean the strainer.**
	• No water in the operating water system.	**Check the operating water system and make sure any supply valves are open.**
	• Hoses between the supply valves and separator are incorrectly fitted.	**Fit correctly.**
	• Nozzle in bowl body clogged	**Clean the nozzle.**
	• Rectangular ring in discharge slide is defective.	**Renew the rectangular ring.**
	• Valve plugs are defective.	**Renew all plugs.**
	• Supply valve SV15 for opening water is leaking.	**Rectify the leak.**
Oil pressure sensor PT4 - ERROR	• Sensor or cable damaged	**Replace sensor. If no spare sensor available set parameter Pr 10=0.0 to be able to run the system.**

The display shows	Why?	What to do
OIL PRESSURE PT4 HIGH DURING Ti70	• No decrease in oil pressure during this timer.	**Check function of change-over valve V1.**
NO PT4 PRESSURE FEEDBACK DURING	• No increase in oil pressure during this timer.	**Check supply of displacement water. Valve SV 10.**
Pressure in water outlet PT5 - HIGH	• Paring tube not moving correctly	**Check that movement is not impeded by friction.**
Pressure in water outlet PT5 - LOW	• Paring tube not moving correctly	**Check that movement is not impeded by friction.**
Water pressure sensor PT5 - ERROR	• Sensor or cable damaged	**Check cable connections** **Replace sensor. If no spare sensor available set parameter Pr 12=0.0 to be able to run the system.**
Feed pressure PT1 - HIGH	• Pipe restricted	**Check recirculation for restriction**
Feed pressure PT1 - LOW	• Low flow	**Check pump and flow regulation.** **Check heater for fouling.**
Feed pressure sensor PT1 - ERROR	• Sensor or cable damaged	**Check cable connections** **Replace sensor. If no spare sensor available set parameter Pr 14=0.0 to be able to run the system.**
Pump starter - FAILURE	• Feedback signal from contactor K 3 missing	**Check the contactor function.** **Check input terminal X 9:1 in the EPC.**

The display shows	Why?	What to do
NO SIGNAL FROM EXTRA INPUT X6:8	• Depends on use of the input	**Depends on use of the input**
Separator run-up - TOO LONG	• Separator coupling slipping	**Check the coupling.**
	• Belt slipping	**Check the belt.**
	• Height position of paring disc is incorrect.	**Stop. Check and adjust the height.**
	• Motor failure	**Repair the motor.**
	• Bearing(s) damaged or worn.	**Renew all bearings.**
	• Separator start button not pushed.	**Push start button.**
Heater - FAULT	• 0V in cable heater X 12:3 to EPC 50 X 51:4 (electric heater)	**Check the power supply to the heater.**
	• High temp. switch released (electric heater)	**Check temp. setpoint in the control unit.** **Check the heater and clean if necessary.** **Reset temp. switch in power unit. Restart heater.**
MT 50 board - ERROR	•	**Change MT50 Board (see *Change of Circuit Board* in the *Service Manual* booklet).**
Transducer value - HIGH	• Extremely high water content	**Check the dirty oil quality.**
	• Fouling in the monitor MT 50	**Dismantle and clean with detergent.**
Transducer value - LOW	• Too much air in oil outlet	**Check oil back pressure**
LO DRAINING FREQUENTLY	• Too much water in oil	**Investigate cause and remedy.**

The display shows	Why?	What to do
Alcap in standby - MORE THAN 24 HOURS	• Reminder	**Check the reason for stand by and try to get back to normal operation as soon as possible.**
Water drain - INSUFFICIENT	• Much water in the feed	**Check the dirty oil quality.**
	• Paring tube not moving properly	**Check that movement is not impeded by friction.**
Water drain pressure - HIGH	• Water pressure has not decreased sufficiently though valve V5 open.	**Check V5 function.**
NO PT5 DRAIN FEEDBACK DURING Tixx	• Restriction in water outlet causing no reduction in pressure	**Clean the outlet pipe.**
Transducer - NO RESPONSE	• Expected increase of trigger signal during Ti 64 and Ti 65 failed	**Check water supply. Valve SV 10.**
Discharge feedback - ERROR	Speed not decreased as discharge feedback (below min. alarm limit) caused by:	
	• Strainer in the operating water supply is clogged.	**Clean the strainer.**
	• Water flow too low.	**Check opening water. Valve SV 15 flow = 11 l/min.**
	• Hoses between the supply valves and separator are incorrectly fitted.	**Correct.**
	• Rectangular ring in the operating slide is defective.	**Renew the rectangular ring.**
Local OP in control	• Attempt to operate remote OP	**Not legal when local OP is active.**
POWER FAILURE	• Black-out has occurred with EPC in operation	**Check plant conditions and restart.**

The display shows	Why?	What to do
Parameter xx:xx - ILLEGAL	• If parameters are changed automatically by "thunderstorm" type influence, alarm is given to indicate out of range.	**Switch EPC50 power off. Move X 34 on I/O board to position right. Switch power on. Parameters are now all set to default values. Move X 34 back to original position. Adjust all parameter settings to correct value.** **Switch power off and on again.**
xxxxx board - ERROR	• Transducer board, operator panel board, or I/O board in EPC not working	**Check cables to board or replace the board (see *Change of Circuit Board* in the *Service Manual* booklet).**
Computer board - ERROR	• Bad connection	**Check connection**
	• Board faulty	**Replace the board**
Communication - ERROR xxxxx	• Cable errors	**Check cables to board or replace the board (see *Change of Circuit Board* in the *Service Manual* booklet).**
Heater board - ERROR	• Optional heater board in EPC not working	**Check cables to board or replace the board (see *Change of Circuit Board* in the *Service Manual* booklet).**
Vibration board - ERROR	• Optional vibration board in EPC not working	**Check cables to board or replace the board (see *Change of Circuit Board* in the *Service Manual* booklet).**
Heater connection - ERROR	• System cross-connection heater communication error	**Check parameters and cable.**
Temperature increase - TOO SLOW	• Insufficient heating during start (Ti 53)	**Check heater function.**
Temperature - NOT DECREASING	• Heating on during stop sequence	**Check heater function.**
	• Recirculating oil not cooling	**Reset alarm to continue.**

3 Alarm Tests

NOTE

If any parameter value is changed to activate an alarm, do not forget to reset to the original value before operation.

Alarm message	Red diode	Sequence	Method	Terminal	Reaction
Standard functions					
Bowl speed sensor - ERROR		Standst.	Start separator with sensor disconnected.	X6:1	
POWER FAILURE		Start	Switch power off / on during operation		
Feed pressure PT1 - HIGH	PT1	Start	Decrease limit (Pr14)		
Feed pressure PT1 - LOW	PT1	Start	Increase limit (Pr15)		
Feed pressure sensor PT1 - ERROR	PT1	Start	Disconnect sensor	X5:4	
Pump starter - FAILURE	Pump	Start	Switch pump off		
Oil feed - TEMPERATURE HIGH	TT	Start	Decrease limit (Pr16/Pr19)		V1 off. Heating off.
Oil feed - TEMPERATURE LOW	TT	Start	Increase limit (Pr17/Pr20) or decrease Ti 53	.	V1 off
Temperature alarm sensor - ERROR	TT	Start	Disconnect sensor	X5:2	V1 off Heating off.
Bowl speed - HIGH		Separation	Decrease limit (Fa10)		Stop sequence.
Bowl speed - LOW		Separation	Increase limit (Fa11)		Stop sequence.
Oil backpressure PT4 - HIGH	PT4	Separation	Increase backpressure		V1 off
Oil backpressure PT4 - LOW	PT4	Separation	Decrease backpressure		V1 off
NO PT4 PRESSURE FEEDBACK DURING Tixx		Timer Ti 71	Disconnect V4	X8:3	
Oil pressure sensor PT4 - ERROR	PT4	Separation	Disconnect sensor	X5:6	

Alarm message	Red diode	Sequence	Method	Terminal	Reaction
Pressure in water outlet PT5 - HIGH	PT5	Separation	Force the paring tube outwards or decrease limit (Pr12)		
Pressure in water outlet PT5 - LOW	PT5	Separation	Force the paring tube inwards or increase limit (Pr11)		
Water pressure sensor PT5 - ERROR	PT5	Separation	Disconnect sensor	X5:8	
Transducer value - HIGH	MT	Separation	Decrease limit (Fa23)		V1 off
Transducer value - LOW	MT	Separation	Increase limit (Fa24)		V1 off
Transducer - ERROR	MT	Separation	Disconnect X3 cable plug		
Water drain - INSUFFICIENT		Separation	Add much water to the feed and wait for 5 draining actions. Discharge. After another 5 drainings alarm is given.		V1 off
Discharge feedback - ERROR		Discharge	Disconnect SV15	X8:5	A second attempt to discharge will take place before alarm and stop.
Emergency stop - BUTTON PUSHED		Separation	Push the button		Sep.motor off, heater off, feed on for 3 min, stop.
Optional functions					
Temperature control sensor - ERROR	TT	Start	Disconnect	X51:3	
Heater - FAULT	Heater	Start	Disconnect	X51:4	
Sludge tank level - HIGH	Tank	Start	Disconnect	X201	
NO SLUDGE LEVEL SIGNAL	Tank	Discharge	Disconnect X201	X201-X202	
Separator run-up - TOO LONG		Start	Decrease Ti 52 to 1. Start the separator.		Sep. motor off.
Temperature increase - TOO SLOW	TT	Start	Start separator and EPC but not heater, or start system with Ti 53 set to 1.		