



Water supplies

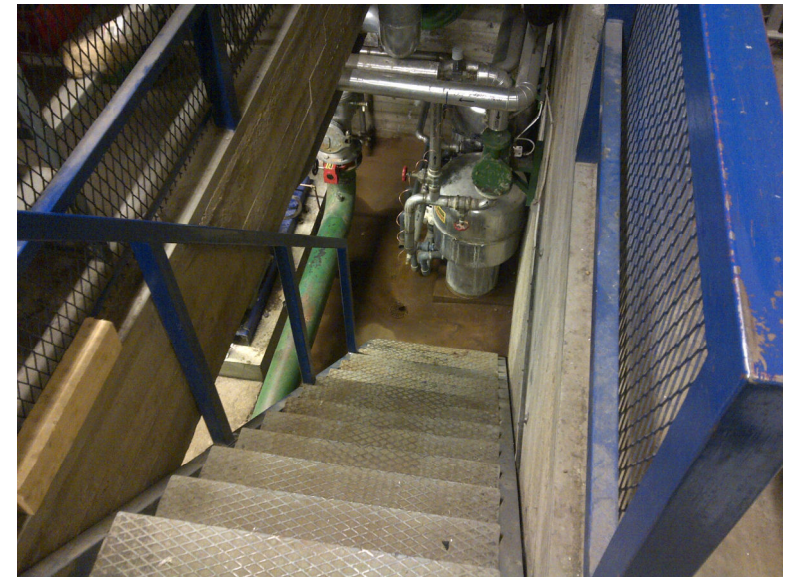
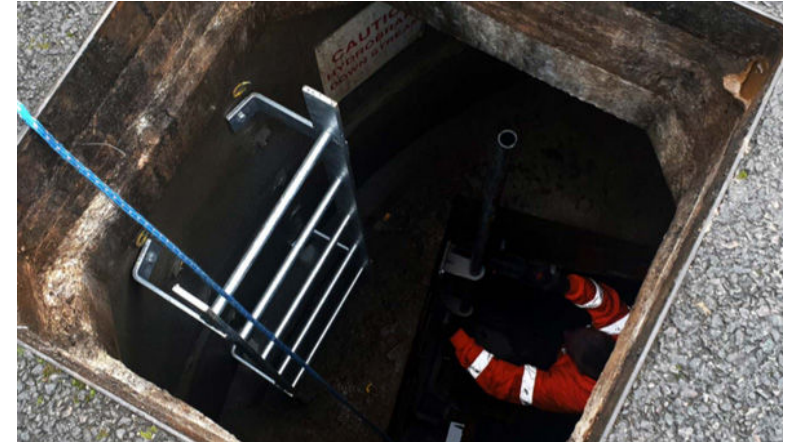
9&10 June 2026

Water Supply Installation

- General
- Mounting, coupling, alignment
- Suction piping
- Flow test line
- Fuel spill containment
- Pressure switch arrangement
- Pressure settings
- Alarms
- Run-period timers
- Acceptance testing
- Fire pump monitoring and automatic testing

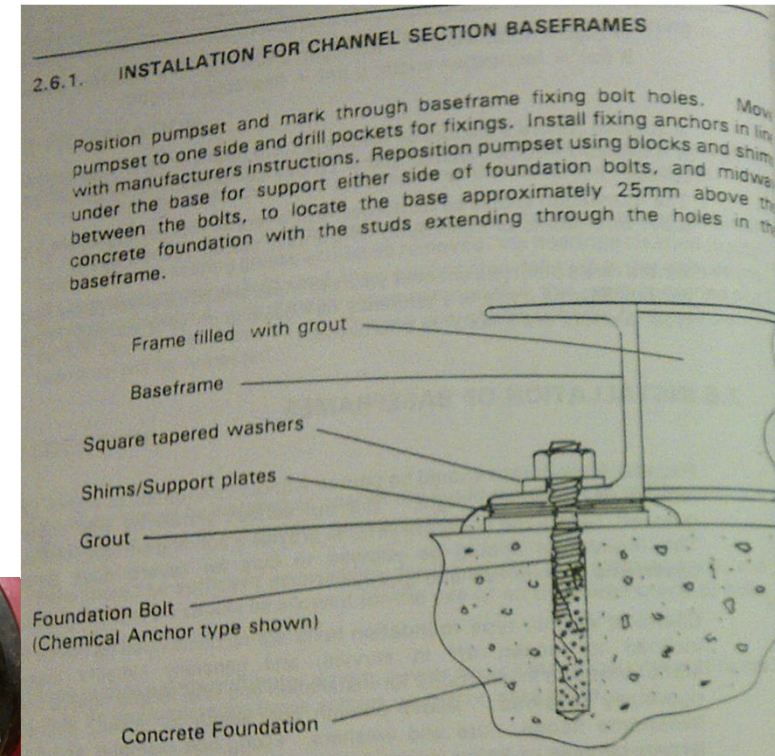
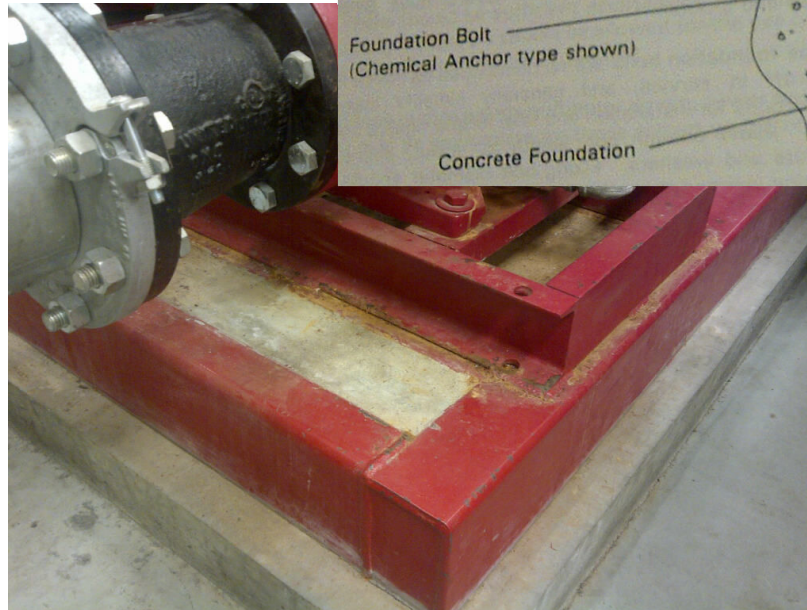
General

- Noncombustible building/room
- Safe ingress and egress e.g., above grade
- Access from the outside
- No need to climb over piping and use ladders to see instruments and gauges
- Adequate ventilation
- Room temperature min. 4°C and engine block heater
- Alarm for low pump room temperature

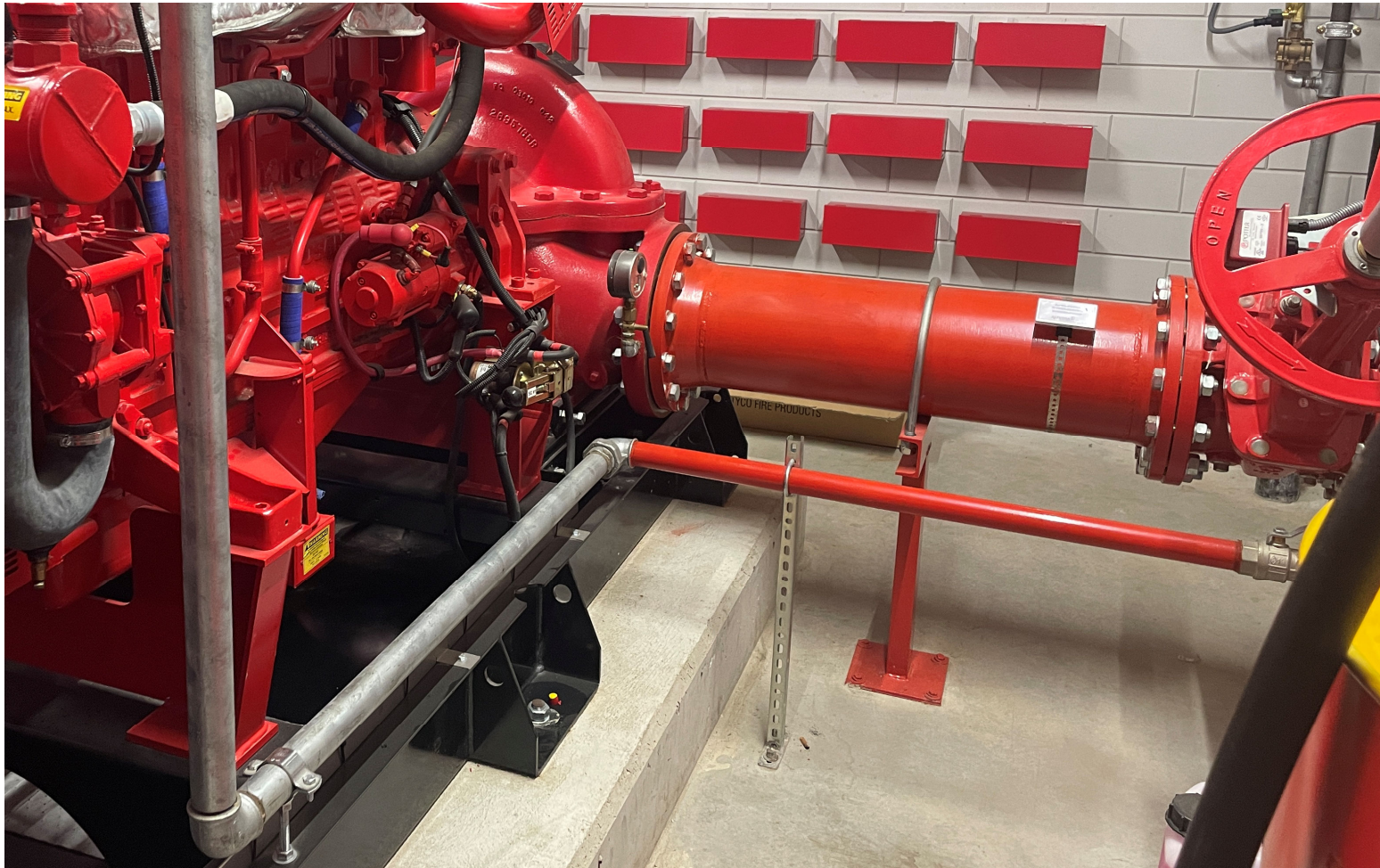


Mounting, coupling, alignment

- Engine and pump should be mounted securely on a common frame and fixed securely to a foundation
- Grout base frame if required per OEM installation manual

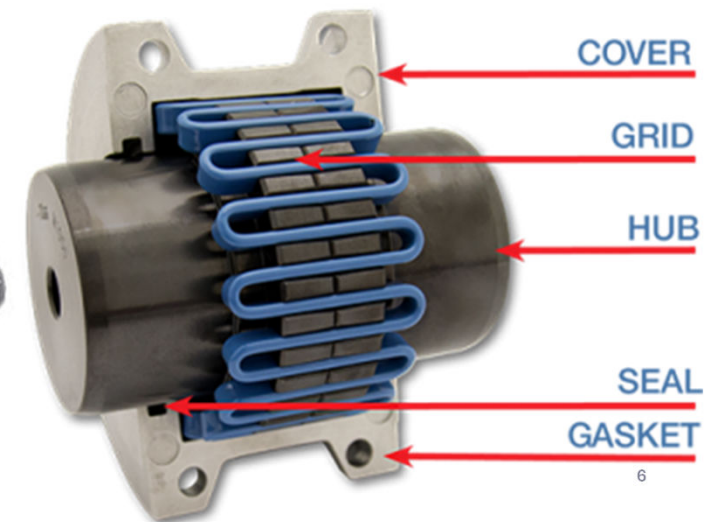
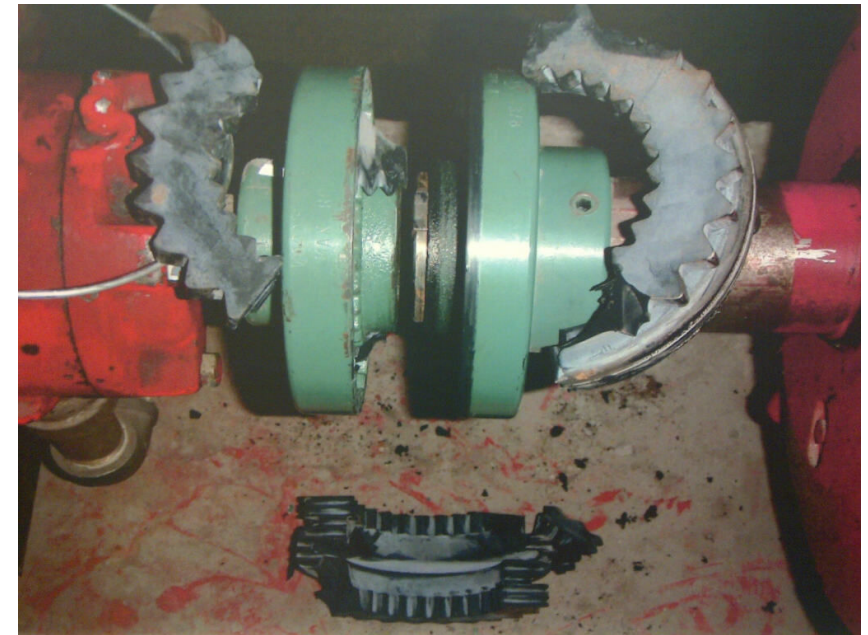


Mounting, coupling, alignment



Mounting, coupling, alignment

- Coupling can be rigid or flexible type
- Do not use all-elastomeric (rubber) type
- Examples of recommended couplings are:
 - ✓ Pin and bushing
 - ✓ Jaw
 - ✓ Disc
 - ✓ Drive shaft
 - ✓ Steel-grid-type couplings, if the drive components are metallic



Mounting, coupling, alignment

- Alignment check per Data Sheet 2-81 (acceptance + annually)

SPRINKLERPUMP EL

SPRINKLERPUMP EL ACShaft

Br. Eriksson Maskin AB
Växelgatan 13
82640 Söderhamn

File information

Name:

SPRINKLERPUMP EL

Location:

Stora Enso Timber AB/Ala sågverk/Pumpum/Srinklerpump

Username:

OPTALIGN

Last measured:

2018-08-24 13:30:51

Description

Component:	Type:	Name:	Mounting:
Machine A:	Pump	Pump	Static machine
Coupling 1:	Short flex		
Machine B:	Motor with fan	Elmotor	4 Feet

Dimensions (graphical)

A

Pump

2970 RPM

B

Elmotor

Dimensions

Coupling 1:	
Coupling diameter	100 [mm]
Distance to the right machine	380 [mm]
RPM	2970 [RPM]
Machine A:	
Machine B:	
Length	412 [mm]

PRÜFTECHNIK ALIGNMENT CENTER licensed to: Br. Eriksson Maskin El AB / Service

Created with Shaft Alignment2018-09-03 14:41:02Page 1 of 2

SPRINKLERPUMP EL

SPRINKLERPUMP EL ACShaft

Result Graphic

Measured values minus presets

V

-0.44 mm

0.21 mm

H

0.13 mm

0.00 mm

Corrections

	vertical	horizontal Units
Machine A:		
Stationary Machine		
Machine B:		
Foot 1	-1.88	0.49 [mm]
Foot 2	-3.69	1.01 [mm]

Coupling Results

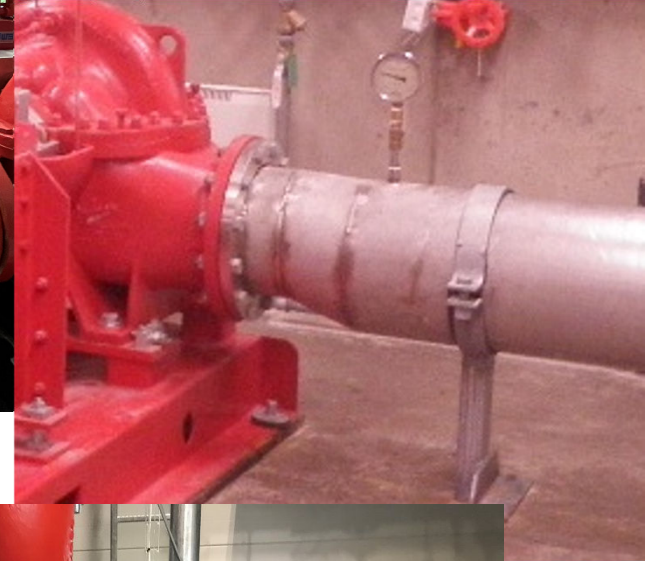
	vertical	horizontal Units
Coupling 1:		
Actual minus specification		
Gap	-0.44	0.13 [mm]
Offset	0.21	0.00 [mm]
Actual		
Gap	-0.44	0.13 [mm]
Offset	0.21	0.00 [mm]

PRÜFTECHNIK ALIGNMENT CENTER licensed to: Br. Eriksson Maskin El AB / Service

Created with Shaft Alignment2018-09-03 14:41:02Page 2 of 2

Suction piping

- Independently supported
- If required, eccentric reducer
- Straight (>10 diameters)
- OS&Y type suction isolation valve
- Do not use rubber flexible/expansion bellows
- If flexible joints are needed for earthquake design, use FM Approved all-metal type



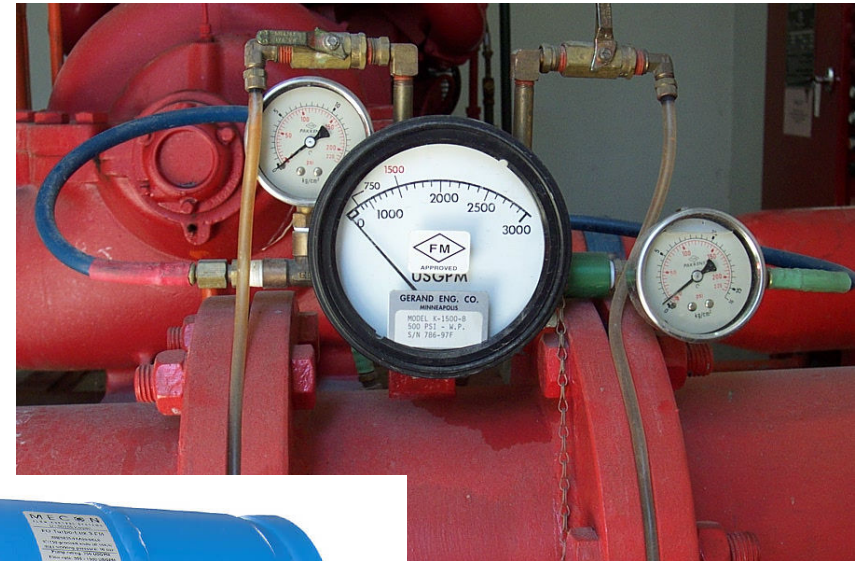
WATER SUPPLIES

Flow test line



Flow test line

- Sized for 150% of the pump rated flow (for 3 x 50% pump arrangements, size test line to be able to test 2 pumps each at 150% of rated flow)
- For in-line flow meters, no control valve within 10 pipe diameters of the flow meter inlet or within 5 of the outlet
- FM Approval Standard 4020 says the test line should discharge back into a different quadrant of the suction tank to the suction line (more than 90° away)
- *Discharge isolation valves should not be closed during testing*



Flow test line

- Sized for 150 mm diameter (for 300 mm diameter test line should discharge into different quadrant than the suction line (must not be closed during testing)
- FM Approved
- Discharge isolation valve must not be closed during testing



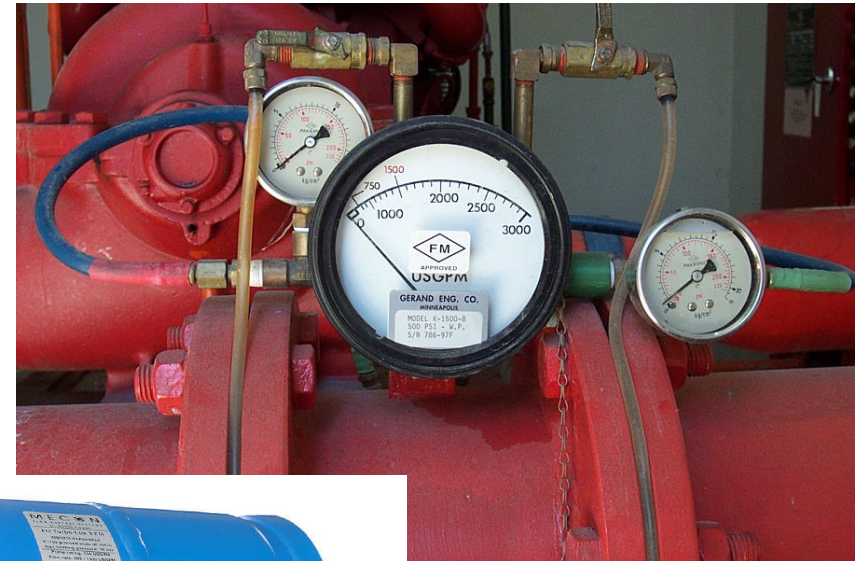
Details

Category	Sensors, Flow, Explosive Atmospheres - US
Certification Type	FM Approved
Protection Concepts	Protection by enclosure, Nonincendive, Increased safety
EPL Category	Gc/3G, Dc/3D
Certificate Number	FM25US0016X
Listing Country	Germany



Flow test line

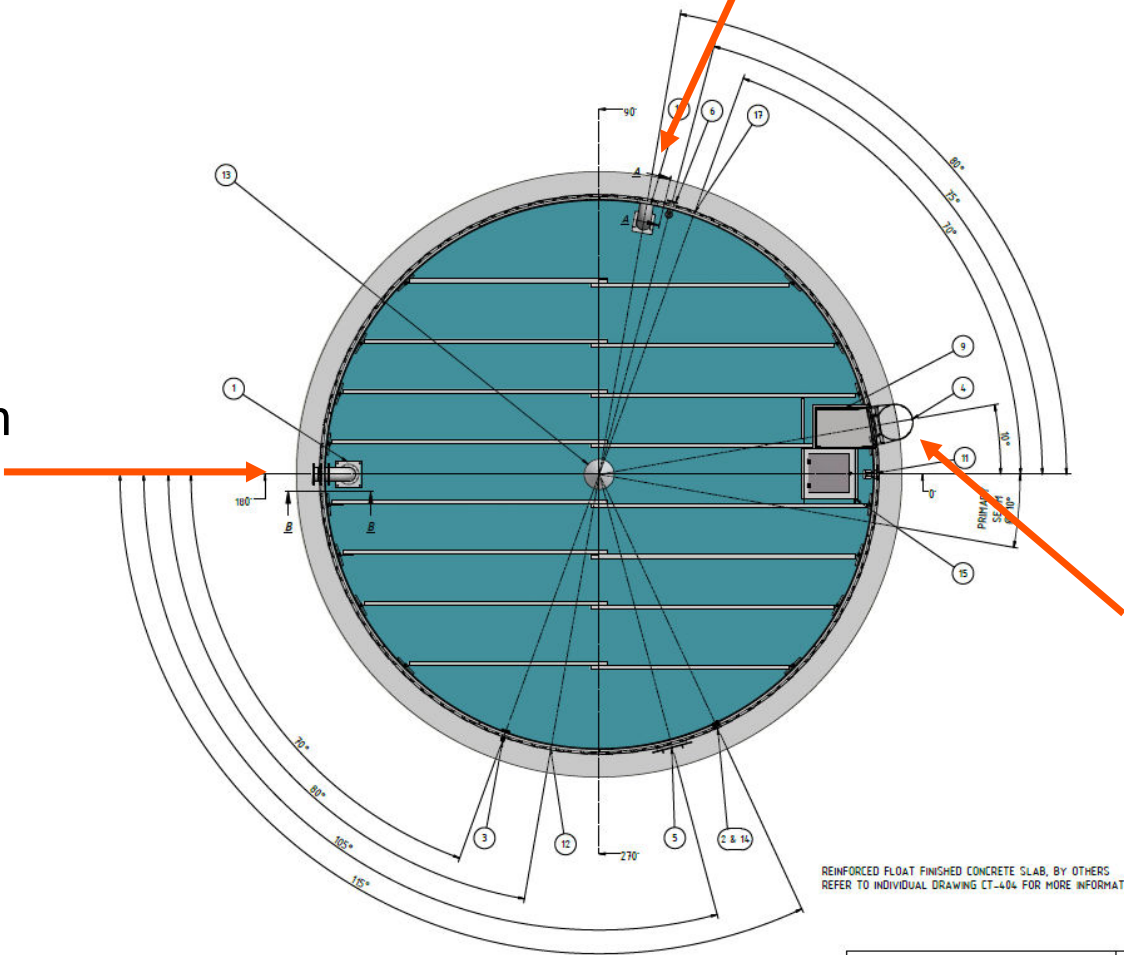
- Sized for 150% of the pump rated flow (for 3 x 50% pump arrangements, size test line to be able to test 2 pumps each at 150% of rated flow)
- For in-line flow meters, no control valve within 10 pipe diameters of the flow meter inlet or within 5 of the outlet
- FM Approval Standard 4020 says the test line should discharge back into a different quadrant of the suction tank to the suction line (more than 90° away)
- *Discharge isolation valves should not be closed during testing*



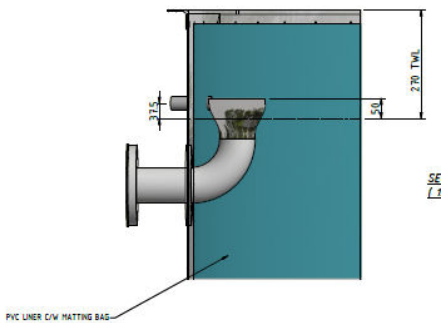
Flow test line

Suction
pipe

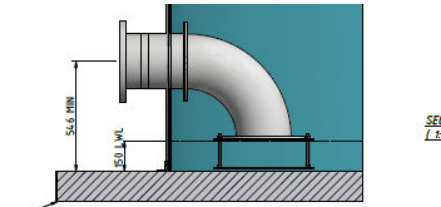
Test line return connection



GIDE	2	Contents Gauge	CGG-10M-CYL	1	250
GIDE	3	Drain	GDV-2"-CYL	1	155
COVER	4	External Ladders	CLD-8C-WH-2H	1	8470
GIDE	5	Handways	CHW-400S-D+	1	760
GIDE	6	Overflow	COF-80-GAL-RIT	1	8750
GIDE	7	Pipe Brackets	CPB-MW-250	3	N/A
GIDE	8	Pipe Brackets	CPB-MW-50	3	N/A
COVER	9	External Ladders	CLD-1.75R-D+	1	8470
COVER	10	Pump Test Return	CTR-250-GAL-ANGS+	1	8795.5
COVER	11	Inlet	CTR-50-GAL+	1	8603
GIDE	12	Labels	CYL-LOGO-BAL-2H	1	6635
GIDE	13	Vent	RT-VENT-GAL-450	1	ROOF
GIDE	14	Labels	PH-LABEL	1	1000
GIDE	15	Handways	PHWL-VXL-CYL+	1	8470
GIDE	16	Sundries	PALLET-SMT-EXP	4	N/A
GIDE	17	Warning Pipe	TCN-1-CYL	1	8237.5



Inlet (fill) line



REINFORCED FLOAT FINISHED CONCRETE SLAB, BY OTHERS
REFER TO INDIVIDUAL DRAWING CT-404 FOR MORE INFORMATION

Fuel spill containment

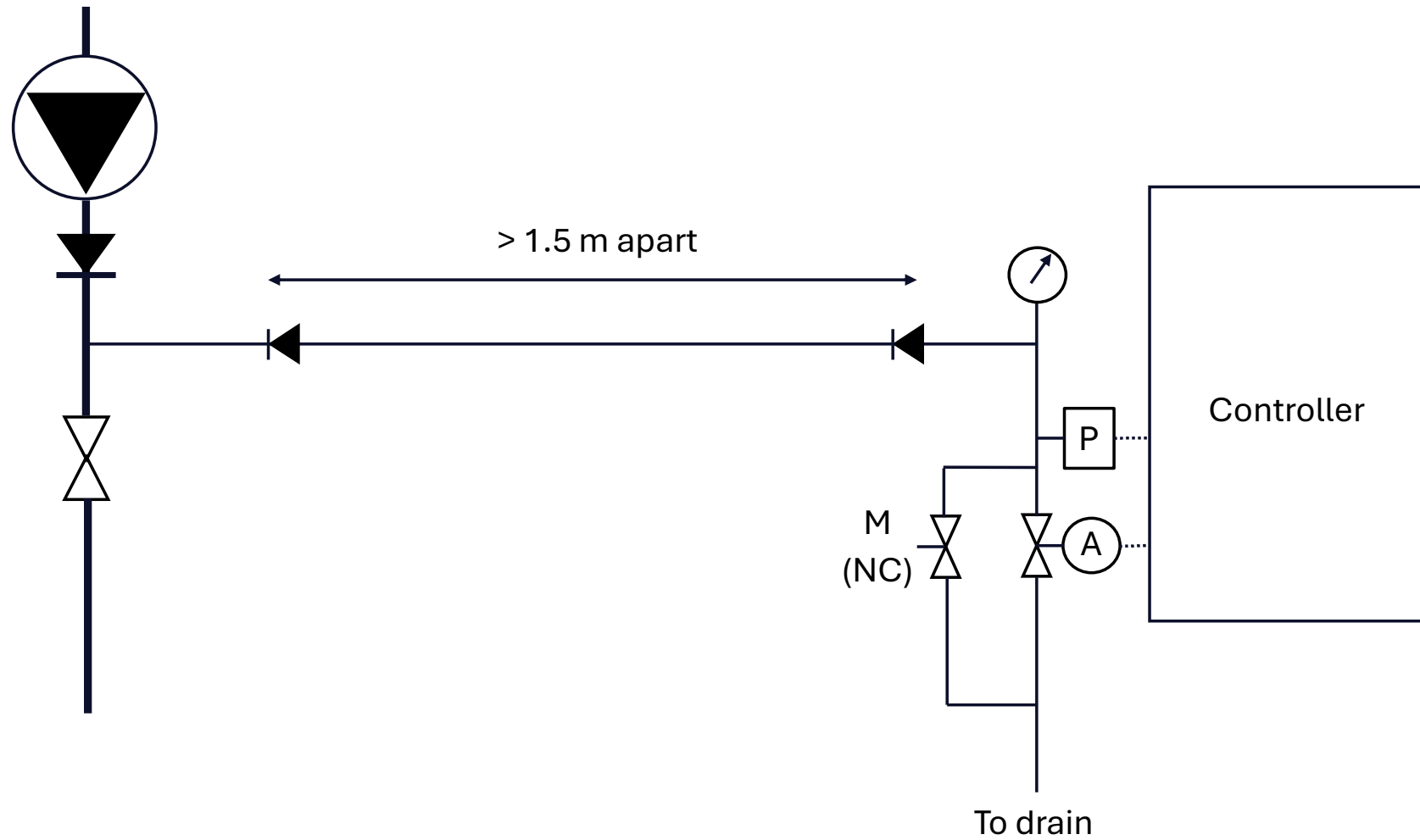
- Double-wall tank
- Fill and vent lines to the outside
- Containment bund around tank (100% + 50 mm freeboard)
- Fuel piping should be protected against damage
- Engine-skid mounted tanks acceptable if <1000 L, double-walled, low-fuel level alarm etc



Pressure switch arrangement

- Each controller should have a separate pressure sensing line (no common point of failure)
- No isolation valves
- Min. 12.5 mm corrosion resistant metal (stainless steel, brass, or copper)
- Connect between pump check valve and discharge isolation valve
- Two check valves min. 1.5 m apart with 2.3 mm holes drilled in the clappers

Pressure switch arrangement



Pressure settings

- Jockey pump start = pump churn pressure + static suction pressure + 0.3 bar
- Jockey pump stop = jockey pump start + 0.7 bar
- Fire pump 1 start = jockey pump start – 0.3 to 0.7 bar
- Fire pump 2 start = pump 1 start – 0.3 to 0.7 bar
- Etc

Pressure settings

Example:

- Pump churn pressure (no flow) = 10 bar
 - Static suction pressure (tank head pressure) = 0.4 bar
 - Jockey pump start = $10 + 0.4 + 0.3 = 10.7$ bar
 - Jockey pump stop = $10.7 + 0.7 = 11.4$ bar
 - Fire pump 1 start = 10.0 to 10.4 bar
 - Fire pump 2 start...
- Fire pump should start at or above churn pressure (no water hammer)*

Alarms

- Separate remote alarms for:
 - Pump switched to manual
 - Pump running
 - Loss of power
 - Failure to start
- Tested at acceptance + annually
- Priming tanks: Alarm at low-level and start pump at low-low level

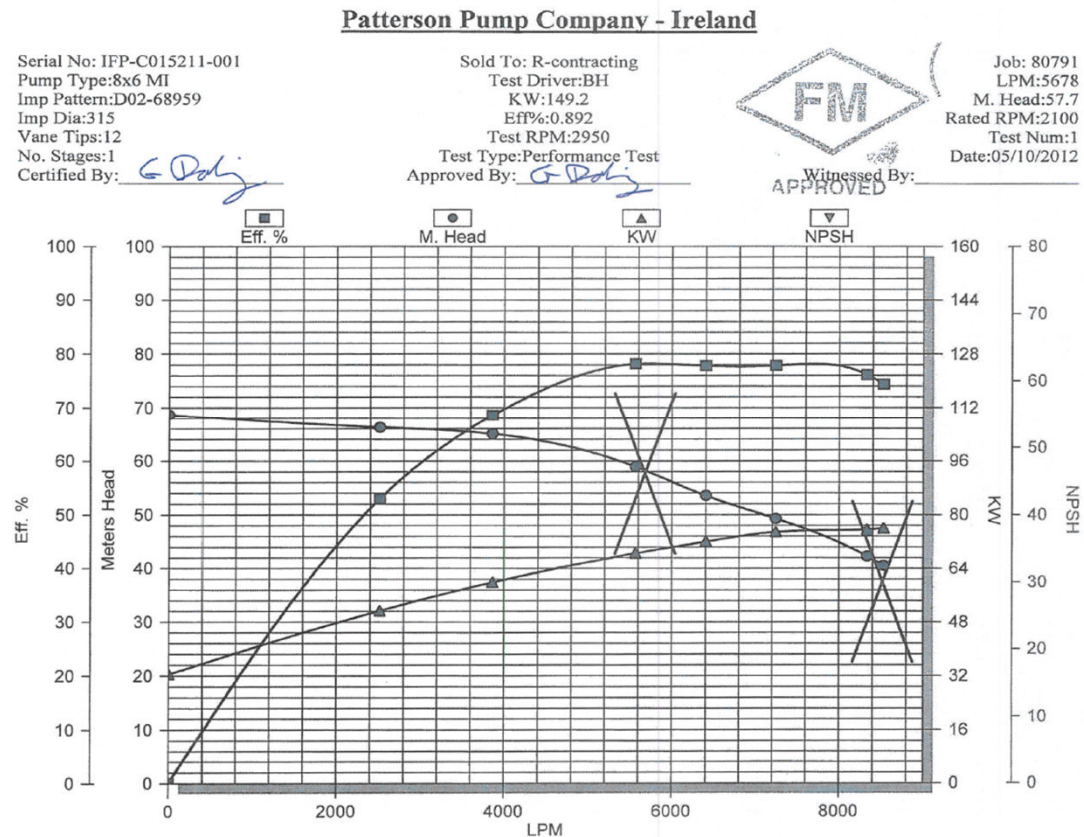
Run-Period Timers

- Fire pump controllers should be manual stop only
- Run period timers should be disabled per the instruction manual (should be supplied as such in Europe)
- FM Approved controllers with weekly churn test timers – best advice is not to use this function (pump should be attended anyway during weekly testing)

WATER SUPPLIES

Fire pump acceptance testing

- All FM Approved pumps should come with a shop curve. This must be submitted.



Fire pump acceptance testing

- All FM Approved pumps should come with a shop curve. This must be submitted.
- Test five points from 0% to 150% of rated flow i.e., 0%, 50%, 100%, 125%, 150%
- Measure suction pressure, discharge pressure, RPM, voltage/current (electric pumps)
- Adjust flow and net pressure for engine speed
- 6 starts manually and 6 starts by pressure drop
 - Electric motors run 5 minutes between starts
 - Electric motors >150 kW, 2 starts in 10-12 hours and 15 minutes run time

Check of how the pump is performing (not just whether it can meet the sprinkler demand)

Fire pump acceptance testing

Pump Rating 7570 LPM @ 8.6 bar, 2100 RPM

Discharge Pressure	Suction Pressure	Net Pressure	Measured RPM	Flow LPM
10.5	0.4	10.1	2100	0
9.8	0.4	9.4	2100	4000
9.0	0.4	8.6	2090	7500
8.2	0.4	7.8	2080	9400
7.0	0.4	6.6	2070	11250

Roughly

50%

100%

125%

150%

Fire pump acceptance testing

Pump Rating 7570 LPM @ 8.6 bar, 2100 RPM

Discharge Pressure	Suction Pressure	Net Pressure	Measured RPM	Flow LPM	RPM Adjusted			
					Flow LPM	Net Pressure	Percent of Pump Rating	Percent of Net Pressure
10.5	0.4	10.1	2100	0	0	10.1	0%	117%
9.8	0.4	9.4	2100	4000	4000	9.4	53%	109%
9.0	0.4	8.6	2090	7500	7536	8.7	100%	101%
8.2	0.4	7.8	2080	9400	9490	8.0	125%	93%
7.0	0.4	6.6	2070	11250	11413	6.8	151%	79%

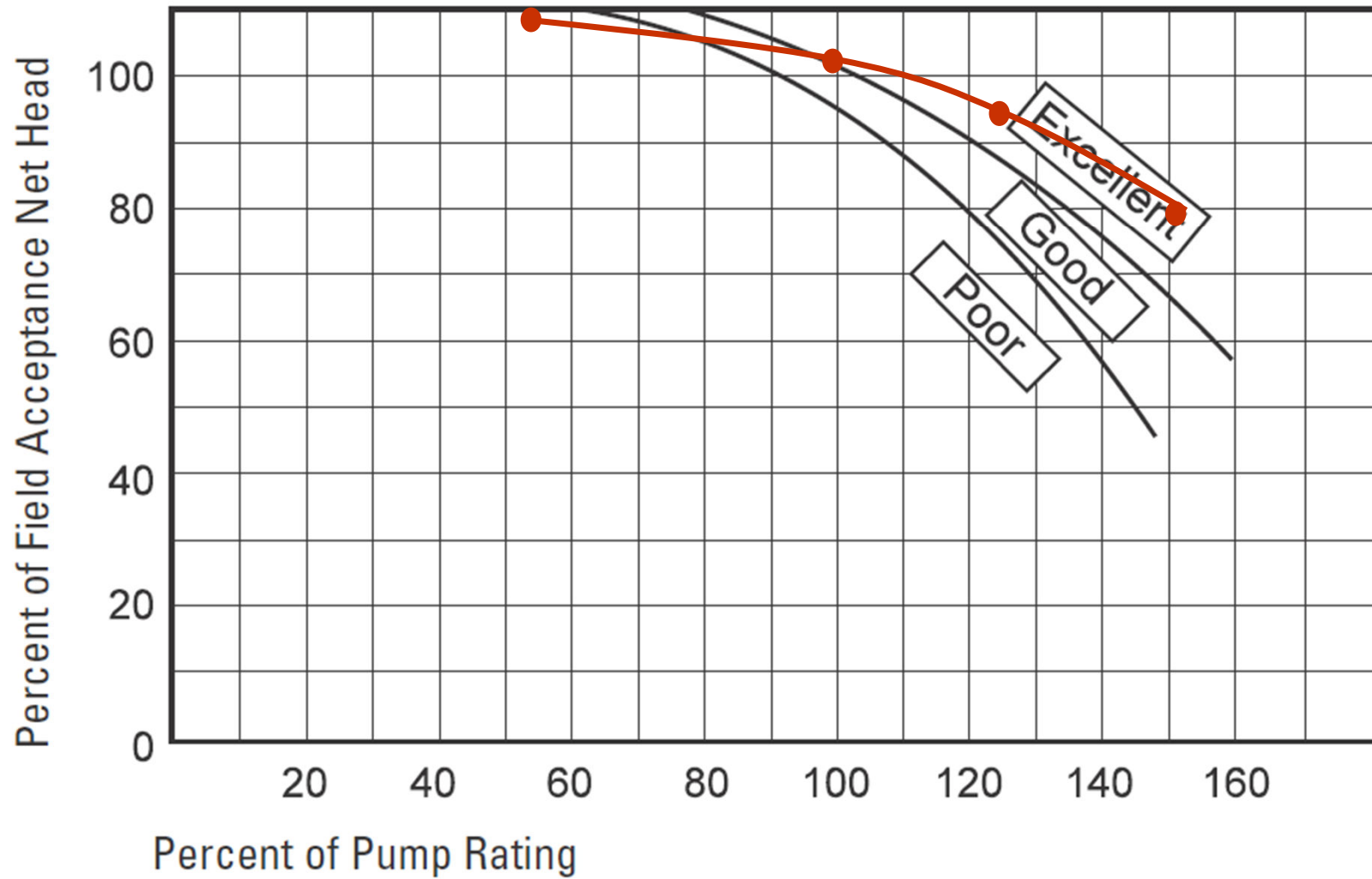
$(\text{Rated RPM} / \text{Measured RPM}) \times \text{Flow}$

$(\text{Rated RPM} / \text{Measured RPM})^2 \times \text{Net Pressure}$

$\text{RPM Adjusted Flow} / \text{Rated Flow}$

$\text{RPM Adjusted Net Pressure} / \text{Rated Pressure}$

Rating Chart

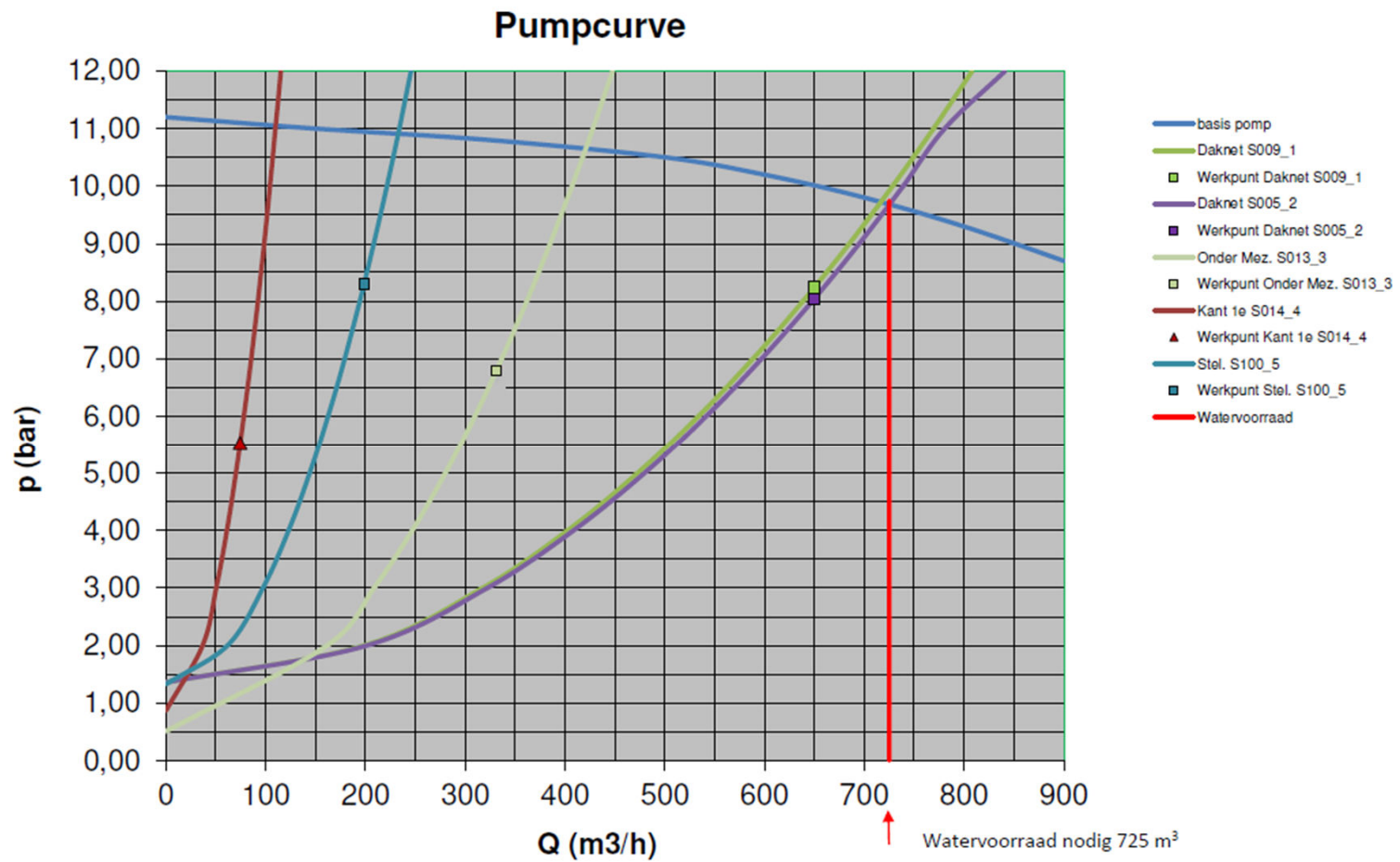


Fire pump acceptance testing

- Pump should rate excellent at its rating and beyond
- When plotting discharge pressure and flow, the curve should be above all sprinkler demand flow and pressures

Discharge Pressure	Suction Pressure	Net Pressure	Measured RPM	Flow LPM	RPM Adjusted			
					Flow LPM	Net Pressure	Percent of Pump Rating	Percent of Net Pressure
10.5	0.4	10.1	2100	0	0	10.1	0%	117%
9.8	0.4	9.4	2100	4000	4000	9.4	53%	109%
9.0	0.4	8.6	2090	7500	7536	8.7	100%	101%
8.2	0.4	7.8	2080	9400	9490	8.0	125%	93%
7.0	0.4	6.6	2070	11250	11413	6.8	151%	79%

Fire pump acceptance testing



Fire pump monitoring and automatic testing

FM Approvals

- FM Approval Standard 1330
 - Power failure
 - Local and remote alarms
 - Low fuel level
 - Pump room temperature
 - Suction and discharge pressures
 - Suction tank level
 - Pump room flooding
 - Pump casing and packing temperature
 - Engine cooling water or circulation relief
 - Vibration
 - Cyber security

CLASS NUMBER 1330

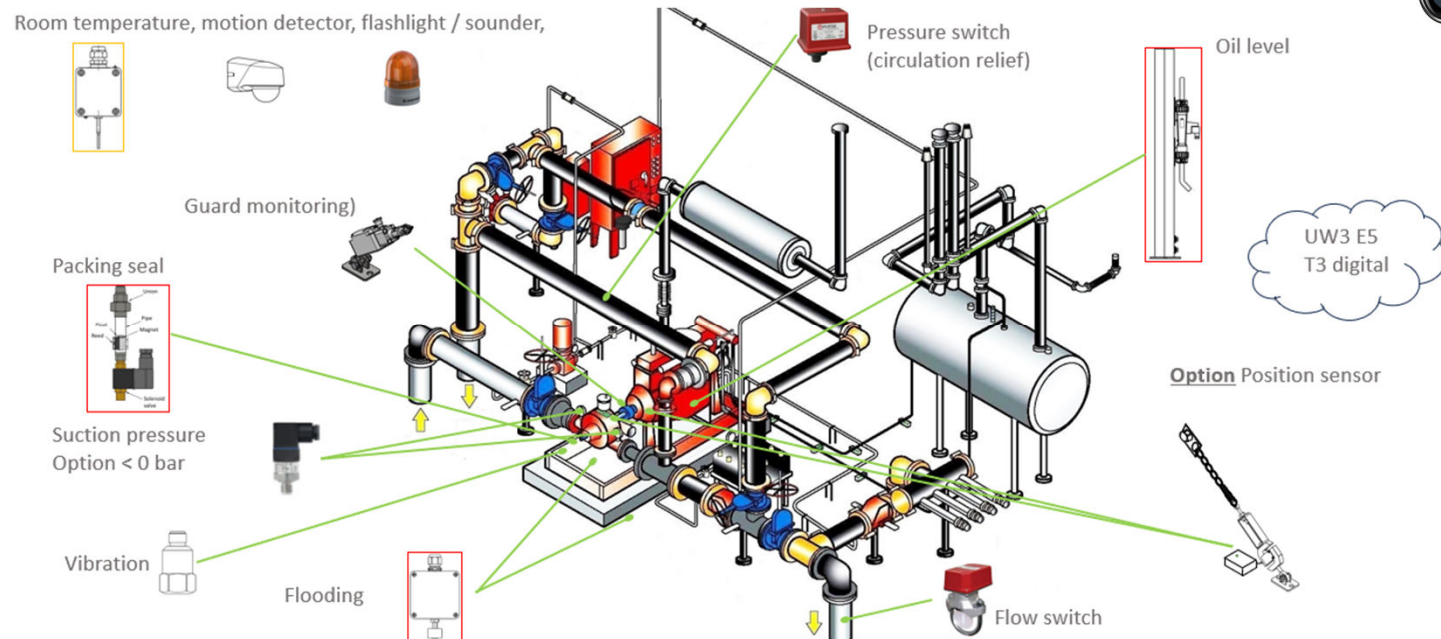
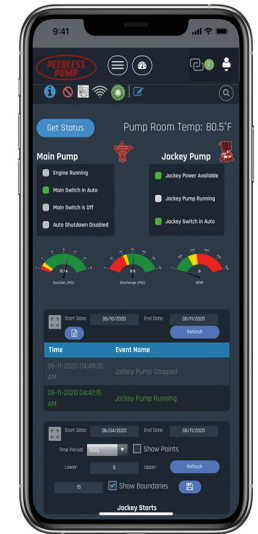
Examination Standard
for Fire Pump
Monitoring and
Automated Testing

February 2024

**Quality Control
Management of Change
Audits**

Fire pump monitoring and automatic testing

- Peerless Fireconnect – Automatic Monitoring System
- Mecon – Fully Automatic Churn Testing System (FACTS)
- FM not accepting non-FM Approved systems



FM



> To er