1.1 Service water booster pumps

- **General**

General	Description
Operating principle	Delivers service water (filtered effluent) to various consumers
Type	Centrifugal
Tag No.	P.CN-0601.2
Dwg. No.	1135-12-00-006
Quantity	1 + 1
Site conditions	
Site elevation m	~ 72 m above sea level
Ambient temp. ºC min/nom/max	5/20/45
Humidity %	Approx. 85
Environment	Corrosive
Location/ erection	Dry, outdoors
Operation	Intermittent
Process	
Medium	Filtered effluent
Temp. ºC min/nom/max	16/25/32
pH value	6.0-8.0
Density kg/m3	1000
Scope of supply	- pumps - drive units - pressure regulating hydrophore tank with inspection door - hydrophore tank pressure relief valve, vent and drain - check valve - low pressure air compressor - all needed interconnecting piping - control instrumentation - support structure. - suitable SS316 baseplates for installation. - connecting SS316 line piping. - integrated control cabinet - electrical cables ending on the platform in a terminal box. - fully automatic controlled operation. - all parts required for onsite erection, ready for operation, including lubricants - O&M manuals and operating curves - 3D specific equipment drawing in Autocad dwg. or STP format - additional requirements as described
Notes	Pumps will start and stop automatically according to the consumers demand. Every single pump will be VFD operated for pressure control and wear reducing, when the demand drops to 0, the delivered pressure slowly runs down until pumps are shut down. In case of power failure (or during commissioning), the service water system will fill the piping system prior to start up to prevent any damage to the piping by surge pressure.

- **Pump**

Manufacturer /Supplier	GRUNDFOS, KSB, WILO, LOWARA
Type / model	Centrifugal, multistage vertical
Designed flow m3/h	80
Designed head m	60
Max. NPSH(R) m	2
No. of boosting pumps in the system	
Min. efficiency in design point %	85
Process connection	Flange
Suction flange	DIN, PN 16
Outlet flange	DIN, PN 16
Inlet connection dia. inch	
Outlet connection dia. inch	
Rotation	
Mechanical seal arrangement	Single

1st mechanical seal type	
2nd mechanical seal type	None
Bearing bracket	Close-coupled
Impeller	
Type	
No. of vanes	
Diameter mm	
Control instrumentation	
Dry running protection	Pressure switch
Hydrophore pressure	Pressure gauge
Compressed air pressure	Pressure gauge
Outlet pressure	Pressure transmitter
Materials of construction	
Casing	SS 304/ SS 316
Pump base	Grey cast iron
Impellers	SS 316
Shaft	SS 316
Elastomers	NBR, EPDM
1st mechanical seal	Tungsten or silicon carbide /ceramics
2nd mechanical seal	None
Base frame	SS 316
Dimensions (L x W x H) m	
Total weight Kg	

- **Drive**

Manufacturer /Supplier	Pumps system supplier
Type	Totally enclosed, fan-cooled
Rated power kW	
Power consumption at max. capacity kW	
Power supply V/Hz	3 x 400 / 50
Rated speed rpm	
Starting method	VFD
Speed control	VFD
Rated current A	
Life time bearings (L10 life) hr	100,000
Insulation class	F
Protection class	IP55
Protective device	Thermal switch
Drive efficiency	IE3

- **Hydrophore tank**

Manufacturer /Supplier	Pumps system supplier
Operating principle	Enables the system to keep a steady pressure without constant pumps starting and stopping.
Type / model	Cylindrical
Volume liters	
Tank orientation	Vertical
Max. operating pressure bar	8.0
Max. test pressure bar	12.0
Process connections	
Water inlet inch	
Water outlet inch	
Compressed air inlet inch	
Pressure gauge inch	
Inspection door inch	
Drain inch	
Materials of construction	
Tank	SS 316
Supporting legs	SS 304
Lifting lugs	SS 304
Bolts / nuts	SS 304
Dimensions (L x W x H) m	
Total weight Kg	

- **Air compressor**

Manufacturer /Supplier		Pumps system supplier
		The air in the tank is compressed and water is pushed down until its drained
Type / model		
Nominal capacity	m^3/h	
Discharge pressure	bar	6.0
Max. pressure	bar	8.0
Discharge temp.	ºC	
Compressed air quality		Oil free
Compressor cooling system		Air cooled
Max. noise exposure	dB(A)	80 (1 m from the compressor)
Control		
Pressure		Control
Over pressure		Switch
High temperature		Switch
Voltage and Amps fault		Switch
Materials of construction		
Casing		Cast iron GG-25
Machine frame		Carbon steel
Bolts / nuts		SS
Panels		Aluminum or steel sheet
Suspension		Vibration absorbers
Dimensions (L x W x H)	m	
Total weight	Kg	

- **Drive**

Manufacturer /Supplier		Compressor supplier
Type		Direct/ belt driven
Rated power	kW	
Power consumption at max. capacity	kW	
Power supply V/Hz		3 x 400 / 50
Rated speed	rpm	
Starting method		Direct
Speed control		N.A
Rated current A		
Life time bearings (L10 life)	hr	100,000
Insulation class		F
Protection class		IP55
Protective device		Thermal switch, 3xPTC
Drive efficiency		IE3