



**Oil -Gas**

**OH2**

**Chemical process pump**

**Model**

**FS-ZL/BB2-600-350X2**

**4-PO2A**

**SR.NO.FS-ZL19601006**

EBARA pumps Europe S.P.A  
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R.E.A.N. 124581 TRENTO

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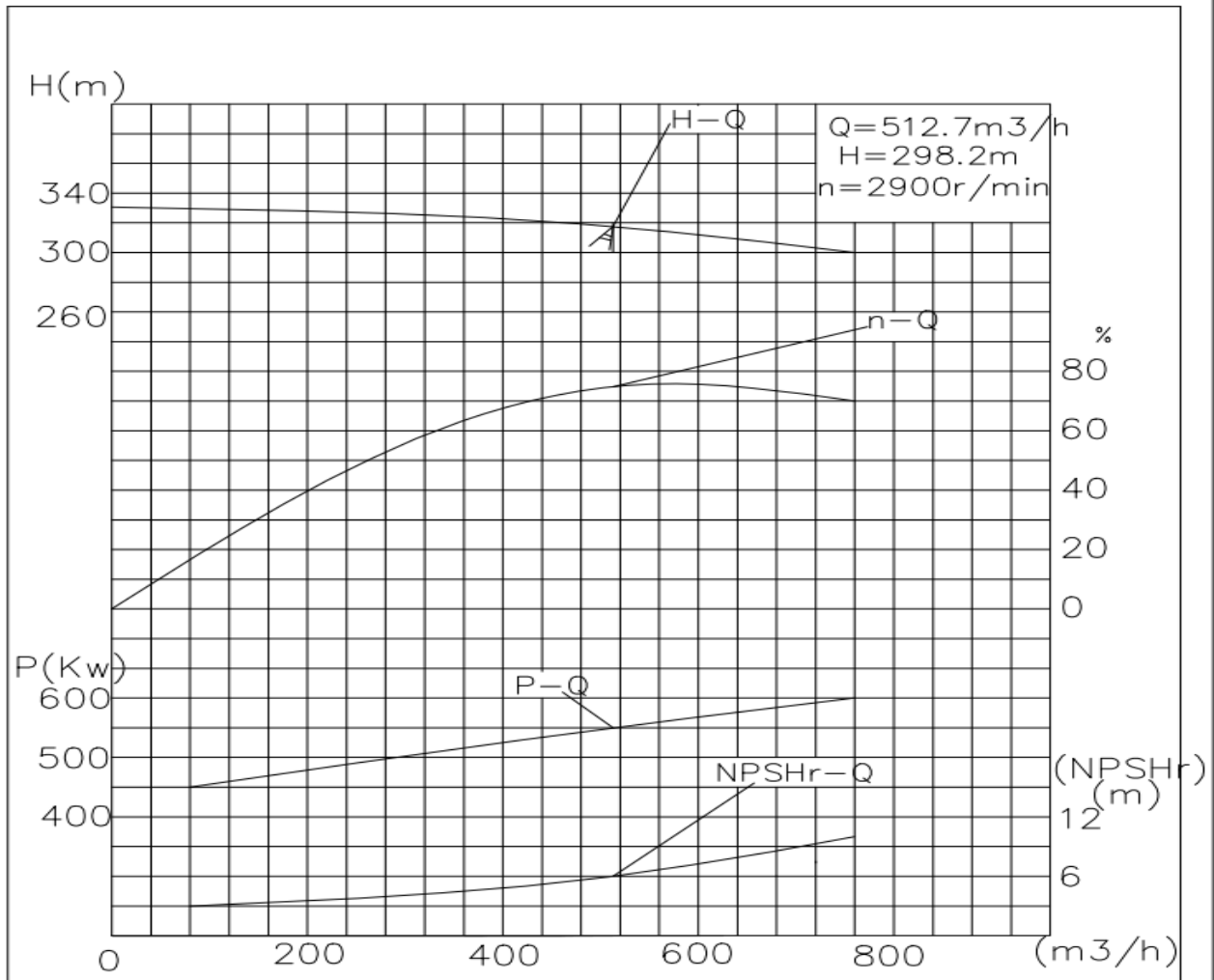
|  |                                      |
|--|--------------------------------------|
| User Name :                                |                                      |
| Device Name :                              |                                      |
| 4-PO2A                                     | Quantity : 1                         |
| Equipment Name: Horizontal multistage pump | Pump Manufacturer :<br>Ebara oil-Gas |
| Pump Model:FS-ZL/BB2-600-350X2             |                                      |

| Working Conditions   |                   | Material(s)   |                      |
|--|-------------------|---|----------------------|
| Flow rate: 512.7   | m <sup>3</sup> /h | Pump body: Cast steel   | Impeller: Cast steel |
| Inlet gauge pressure: (rated/maximum)  | MPa.G             | Shaft: 2Cr13  |                      |
| Outlet gauge pressure:   | MPa.G             | Mechanical seal flushing plan: PLAN32   |                      |
| Lift(H,m) 298.2 m  | (NPSH)a : 60.11 m | Bearing: SKF  | Brand: SKF           |
| Usage : <input checked="" type="checkbox"/> Continuous <input type="checkbox"/> intermittent(Number of starts/per day) |                   | Coupling: 300   |                      |
| Medium   |                   |   |                      |
| Name: light gas oil  |                   |   |                      |
| Working temperature:138.5°C  |                   |   |                      |
| Medium density:836.04kg/m <sup>3</sup>   |                   |   |                      |
| Viscosity (CP): 5.7  |                   |   |                      |
| H <sub>2</sub> S (Hydrogen Sulfide) Concentration (PPM)  |                   | Medium Characteristics: <input type="checkbox"/> Corrosive <input type="checkbox"/> Abrasive <input type="checkbox"/> Toxic |                      |
| Pump performance and structure   |                   |   |                      |
| Pump speed of rotation:2985rpm   | Efficiency: 74 %  | Shaft power: 550kW  |                      |
| Impeller diameter (rated): 330mm   |                   | Impeller diameter (maximum): 350 mm   |                      |
| Impeller diameter (minimum): 300 mm  |                   |   |                      |

|   |               |   |                   |                                 |  |                            |                        |
|---|---------------|---|-------------------|---------------------------------|--|----------------------------|------------------------|
| MCSF:260m <sup>3</sup> /h    NPSH: 6m   |               |   |                   |                                 |  |                            |                        |
| Maximum head at rated diameter: 326m  |               |   |                   |                                 |  |                            |                        |
| From rated head to shutoff head: 93%  |               |   |                   | Head ratio (rated/maximum): 97% |  |                            |                        |
| Flow rate (Best Efficiency Point, BEP): 550m <sup>3</sup> /h  |               |   |                   | Flow ratio (rated/BEP): 93 %    |  |                            |                        |
| Installation form: <input type="checkbox"/> Vertical <input checked="" type="checkbox"/> Horizontal   |               |   |                   |                                 |  |                            |                        |
| Impeller form: <input checked="" type="checkbox"/> Closed <input type="checkbox"/> Open <input type="checkbox"/> Semi-open                                    |               |   |                   |                                 |  |                            |                        |
| Pump Casing Split: Axial <input checked="" type="checkbox"/> Radial   |               |   |                   |                                 |  |                            |                        |
| Pump casing type: <input checked="" type="checkbox"/> Single volute <input type="checkbox"/> Double volute <input type="checkbox"/> Guide casing (guide vane) |               |   |                   |                                 |  |                            |                        |
| Flange standard:<br>GB9111.1-2000   | caliber<br>mm | Flange pressure rating  | Sealing Face Type | Orientation position            | Electric Motor                             |                            |                        |
|   |               |   |                   |                                 | Model: <input checked="" type="checkbox"/> | IBM-450-2-640              |                        |
| Suction port  | 250           | 5MPa  | PF                | Horizontal                      | Explosion-Proof High-Voltage Motor         |                            |                        |
| Discharge port  | 200           | 5MPa  | PF                | Vertical                        | Rated power:<br>640kW                      | Maximum power:             |                        |
| Drain port  | /             | /   | /                 | /                               | Number of Poles:<br>2                      | Speed2985 rpm              | Frequency: 50 Hz       |
| Pump casing design pressure: 5 MPa  |               | Pump Casing Hydrostatic Test: 7.5 MPa   |                   |                                 | Voltage: 3300 V                            | Number of phases : 3 PH    | Frequency: 50 Hz       |
| Maximum working pressure:<br>3.4MPa   |               | Maximum permissible suction pressure:2MPa<br>Maximum permissible working pressure: 5MPa |                   |                                 | Protection Rating:<br>IP55                 | Explosion proof grade: BT4 | Insulation grade:<br>F |
| Bearing type: <input type="checkbox"/> Sliding bearing <input checked="" type="checkbox"/> Radial rolling   |               |   |                   |                                 | Incoming line of junction box:             | Method:                    | Number:                |
| Bearing Lubrication: <input checked="" type="checkbox"/> Oil Bath/Grease <input checked="" type="checkbox"/> Oil Slinger                                      |               |   |                   |                                 |  |                            |                        |



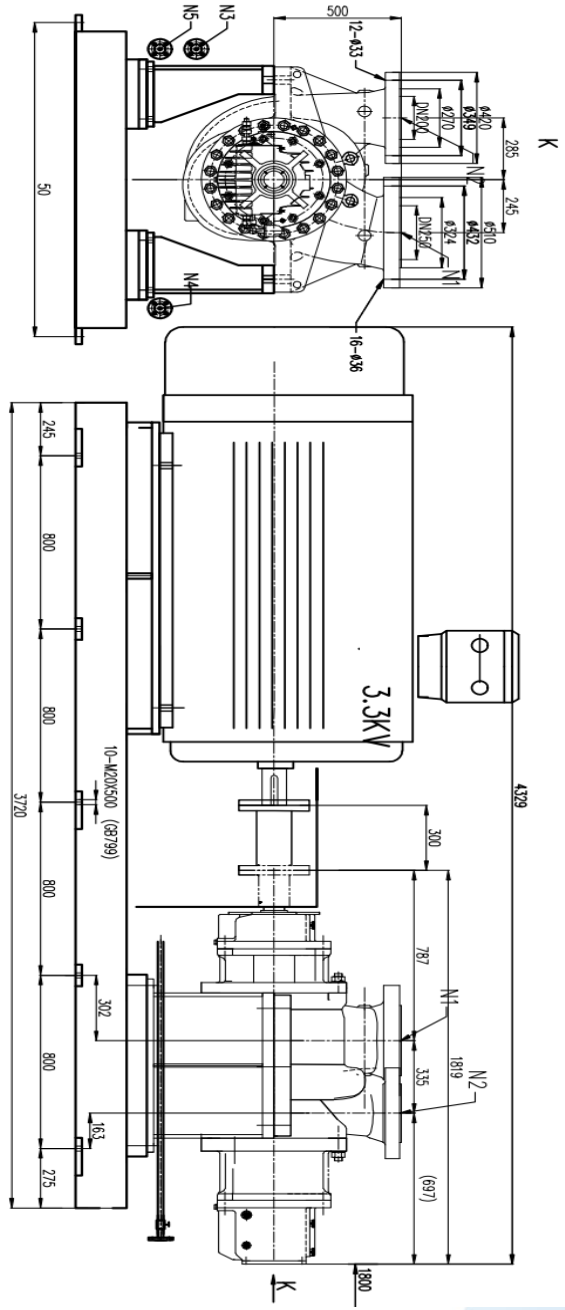
# Oil - Gas



| Line Item | name                       | model               | flow: Q (m3/h) | Lift (H, m) | Quantity | Remark   |
|-----------|----------------------------|---------------------|----------------|-------------|----------|--|
| 4-P02 A   | Horizontal multistage pump | FS-ZL/BB2-600-350X2 | 512.7          | 298.2       | 1        | API610 standard production. Mechanical seal complies with API682 standard, material: cast steel, cartridge mechanical seal, mechanical seal flushing solution PLAN 32 SKF bearing, supply scope pump head + base + diaphragm coupling. |
|           | Explosion-proof motor      | IBM-450-2-640       | 640KW          | 2985r/min   | 1        | Drive standard machine: three-phase motor<br>Motor model: IBM-450-2-640<br>Motor speed: 2985<br>Frequency: 50 Hz<br>Rated voltage: 3300V<br>Rated power: 640KW<br>Protection level: Ex de IIB T3<br>Motor protection level: IP55       |



# Oil - Gas



| Line Item | name                       | model               | Flow: Q (m <sup>3</sup> /h) | Lift(H.m) | Quantity | Remark  |
|-----------|----------------------------|---------------------|-----------------------------|-----------|----------|---|
| 4-702 A   | Explosion proof motor      | IBM 450-2-640       | 640KW                       | 298.2     | 1        | AP1610 standard production. Mechanic complies with API682 standard. Material: steel, cartridge mechanical seal, metal seal finishing solution PLAN 32 SKF type supply scope pump head + base + diaphragm coupling.<br>Drive standard motor: three-phase motor<br>Motor model: IBM 450-2-640<br>Frequency: 50 Hz<br>Rated voltage: 3300V<br>Rated power: 640KW<br>Protection level: Ex de IIB T3<br>Motor protection level: IP55 |
|           | Horizontal multistage pump | FS-ZL/BSZ-600-350M2 | 512.7                       | 298.2     | 1        |   |



## Oil –Gas

|   |                            |
|---|----------------------------|
| <b>Requested flow rate</b>                | 512.7 m <sup>3</sup> /h    |
| <b>Requested developed head</b>           | 298.2 m                    |
| <b>Pumped medium</b>                      | Desalted crude             |
| <b>Temperature</b>                        | 138.5 °C                   |
| <b>Fluid density</b>                      | 836.04 kg/m <sup>3</sup>   |
| <b>Fluid viscosity (cP)</b>               | 5.7                        |
| <b>Vapors pressure</b>                    | 7.48 kg/cm <sup>2</sup> a  |
| <b>Suction pressure max.</b>              | 11.07 kg/cm <sup>2</sup> g |
| <b>Efficiency</b>                         | 0.00%                      |
| <b>Power Absorbed</b>                     | 640                        |
| <b>Pump speed of rotation</b>             | 2900rpm                    |
| <b>NPSH required</b>                      | 6m                         |
| <b>Discharge press.</b>                   | 26 kg/cm <sup>2</sup> .g   |
| <b>Stuffing box press.</b>                | VTA                        |
| <b>Shutoff head</b>                       | 342m                       |
| <b>Shutoff pressure</b>                   | 38kg/cm <sup>2</sup>       |
| <b>Differential pressure</b>              | 14.93 kg/cm <sup>2</sup>   |
| <b>NPSH available</b>                     | 60.11 m                    |
| <b>Ratio Q/Qbep</b>                       | 93.00%                     |
| <b>Max. power on curve</b>                | 550KW                      |
| <b>low for continuous stab</b>            | VTA                        |
| <b>Suction Flange Size &amp; Rating</b>   | DN250 5MPa                 |
| <b>Discharge Flange Size &amp; Rating</b> | DN200 5MPa                 |
| <b>Shaft seal</b>                         | As Per API 682             |
| <b>Shaft seal manufacture</b>             | EBARA                      |
| <b>Sealing plan</b>                       | API plan 21+52             |
| <b>Bearing bracket size</b>               | No. 5 bearing box          |
| <b>Coupling Manufacturer</b>              | EBARA                      |
| <b>Coupling type</b>                      | Diaphragm coupling         |
| <b>Spacer length</b>                      | 300mm                      |

|                             |                        |
|-----------------------------|------------------------|
| <b>Driver type</b>          | Electric Motor         |
| <b>Drive standard mech.</b> | 3-phase Electric Motor |
| <b>Motor const. type</b>    | IBM-450-2-640KW        |
| <b>Motor speed</b>          | 2985                   |
| <b>Frequency</b>            | 50 Hz                  |
| <b>Rated voltage</b>        | 3300                   |
| <b>Rated power P2</b>       | 640KW                  |
| <b>Type of protection</b>   | EEx de IIB T3          |
| <b>Motor enclosure</b>      | IP55                   |
| <b>Volute casing (102)</b>  | Cast Steel             |
| <b>Casing cover (161)</b>   | Cast Steel             |
| <b>Shaft (210)</b>          | 2Cr13                  |
| <b>Impeller (230)</b>       | Cast Steel             |