1. Introduction

This data sheet is valid for APP pumps both non ATEX and ATEX certified. ATEX certified pumps are indicated by Ex in the type designation - example APP 0.6 Ex.

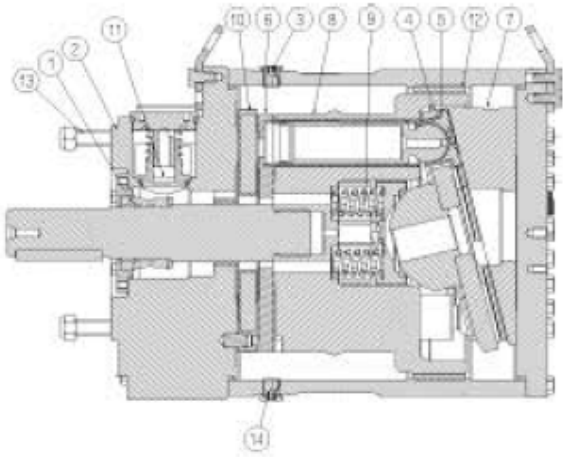
The Danfoss range of APP high-pressure pumps is designed according to EN 809 for use in RO applications with low viscosity and corrosive fluids such as:

- Sea water
- Brackish water
- Waste water (APP W)

Danfoss APP pumps are positive displacement pumps with axial pistons that move a fixed amount of water in each cycle. Flow is proportional to the number of input shaft revolutions (rpm). Unlike centrifugal pumps, they produce the same flow at a given speed no matter what the discharge pressure.

Below sectional drawing is an example of an APP pump. The sectional drawing for the specific pump sizes are to be found in the pump instruction.

1:	Shaft sealing
2:	Port flange
3:	Bleeding plug
4:	Retainer plate
5:	Piston/shoe
6:	Valve plate
7:	Swash plate
8:	Cylinder barrel
9:	Springs
10:	Port plate
11:	Flushing valve (not available on APP 5.1-10.2)
12:	Housing
13:	Tail stock screws
14:	Drain plug



2. Benefits

- **Zero risk of lubricant contamination:**
  - Oil lubricants are replaced with the pumped medium, water, so there is no contamination risk from the pump.
- **Low maintenance costs:**
  - Efficient design and all-stainless steel construction ensure exceptionally long life. When Danfoss specifications are met, service intervals of 8,000 hours can be expected. Service is easy, and can be carried out on-site due to the simple design and few parts.
- **Low energy costs:**
  - The highly efficient axial piston design provides the lowest energy consumption of any comparable pump on the market.
- **Easy installation:**
  - The most compact and lightest design available.
  - The pump can be installed vertically and horizontally.
  - No pulsation dampeners necessary due to extremely low pressure pulsation.
  - Powered directly by electric motors or combustion engines (with special coupling).
  - All pumps except APP (W) 5.1 - 10.2 are supplied with an integrated flushing valve that allows the fluid to flow from inlet to the outlet, when the pump is not running.
- **High reliability:**
  - All parts are made of high corrosion resistant materials e.g. Duplex (EN1.4462/ UNS S31803) and Super Duplex (EN1.4410/UNS S32750) stainless steel and carbon reinforced PEEK.
- **Certified quality:**
  - Pump available as ATEX certified: category 2, zone 1 or category 3, zone 2. For other certifications, please see data sheets for APP S (all super duplex) and APP S 674 (API).
  - Positive Material Identification (PMI) report available on request.
  - IATF 16949, ISO 9001, ISO 14001.

3. Application examples

Danfoss APP pumps are built into a broad range of RO desalination plants around the world:

- Containerized solutions for hotels, resorts and residences on islands and in coastal regions
- Mobile systems for humanitarian and military organizations
- Onboard systems for ships and yachts
- Offshore platforms for the oil and gas industry
- Municipal and regional waterworks

4.5 APP 16-22

Pump size		APP 16/1200	APP 16/1500	APP 17/1200	APP 17/1500	APP 19/1200	APP 19/1500	APP 22/1200	APP 22/1500
Code number APP		180B3254	180B3250	180B3255	180B3251	180B3256	180B3252	180B3257	180B3253
Code number APP ATEX[3]		180B3264	180B3260	180B3265	180B3261	180B3266	180B3262	180B3267	180B3263
Geometric displacement	cm^3/rev.	234.6	188.3	253.3	197.5	272.3	219.7	310.6	253.3
	in^3/rev.	14.32	11.49	15.46	12.05	16.62	13.41	18.95	15.46
Pressure									
Max. outlet [1] pressure continuous	barg	80	70	80	70	80	70	80	70
	psig	1160	1015	1160	1015	1160	1015	1160	1015
Min. outlet [1] pressure	barg	10	10	10	10	10	10	10	10
	psig	145	145	145	145	145	145	145	145
Inlet pressure continuous	barg	2 - 5	2 - 5	2 - 5	2 - 5	2 - 5	2 - 5	2 - 5	2 - 5
	psig	29 - 72.5	29 - 72.5	29 - 72.5	29 - 72.5	29 - 72.5	29 - 72.5	29 - 72.5	29 - 72.5
Max. inlet pressure peak	barg	10	10	10	10	10	10	10	10
	psig	145	145	145	145	145	145	145	145
Speed									
Min. speed continuous	rpm	700	700	700	700	700	700	700	700
Max. speed continuous	rpm	1200	1500	1200	1500	1200	1500	1200	1500
Typical flow - Flow curves available in item 5									
1000 rpm at max. pressure	m^3/h	13.38	10.67	14.57	11.25	15.71	12.55	18.06	14.61
1500 rpm at max. pressure	m^3/h		16.01		16.88		18.82		21.92
1200 rpm at max. pressure	gpm	70.70	56.40	76.98	59.44	82.98	66.30	95.43	77.21
Technical specifications									
Media [2] temperature	°C	2 - 50	2 - 50	2 - 50	2 - 50	2 - 50	2 - 50	2 - 50	2 - 50
	°F	35.6 - 122	35.6 - 122	35.6 - 122	35.6 - 122	35.6 - 122	35.6 - 122	35.6 - 122	35.6 - 122
Ambient temperature	°C	0 - 50	0 - 50	0 - 50	0 - 50	0 - 50	0 - 50	0 - 50	0 - 50
	°F	32 - 122	32 - 122	32 - 122	32 - 122	32 - 122	32 - 122	32 - 122	32 - 122
Weight (dry)	kg	78	78	78	78	78	78	78	78
	lb	172	172	172	172	172	172	172	172
Sound pressure level[4]	dB(A)	84	84	84	84	84	84	84	84
Footprint with IEc motor[5]	m^2	0.54	0.58	0.59	0.59	0.76	0.76	0.80	0.80
	$foot^2$	5.81	6.26	6.35	6.35	8.18	8.18	8.61	8.61
Typical motor size									
Max. speed at max. pressure	kW		37.0		37.0		45.0		55.0
1200 rpm at max. pressure	HP	60.0		60.0		75.0		75.0	
Torque at max. outlet pressure	Nm	316	223	343	234	372	263	426	305
	lbf-ft	233	165	253	173	275	194	314	225

[1] For lower and higher pressure, please contact Danfoss.
[2] Dependent on the NaCl concentration - see chapter 8.
[3] Category 2, Zone 1 or Category 3, Zone 2.
[4] A-weighted sound pressure level at 1 m from the pump unit surfaces (reference box) acc. to EN ISO 20361 section 6.2. The noise measurements are performed acc. to EN ISO 3744:2010 on a motor-pump unit at max. pressure and speed.
[5] Max. area covered with recommended motor configuration (excl. of space to service pump)