

## X20 Controls Brochure

Meet an open-circuit piston pump that's built for better precision, performance and productivity.

### It's time for an open-circuit piston pump that's built for better.

With sophisticated controls that enhance system efficiency, and a compact design that delivers incredible power, the Danfoss **X20 portfolio of open-circuit piston pumps** is built to maximize machine performance and productivity. Plus, with a variety of advanced electronic control options and a reputation for

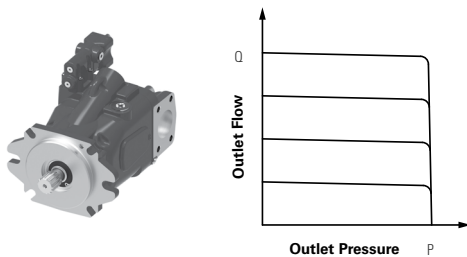
remarkable reliability, the X20 portfolio makes it easy to design smarter, more efficient machines that work and keep working in the most demanding applications.

**Experience X20 – a small pump with big power that's built for better productivity, fuel efficiency, control and reliability.**

**X20 features sophisticated controls that improve performance while optimizing efficiency.**

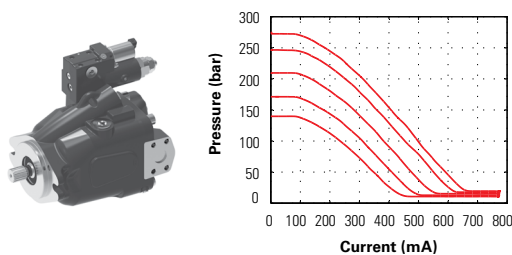
#### Load sense control

Limits outlet pressure to a set margin above load pressure.



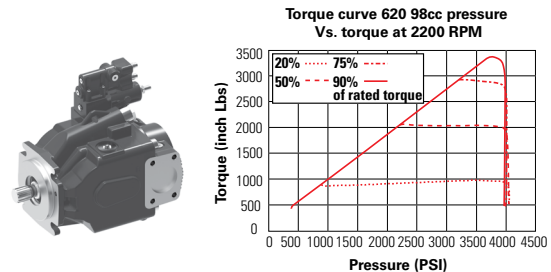
#### Electronic inverse proportional pressure control

Limits outlet pressure negatively proportional to signal current.



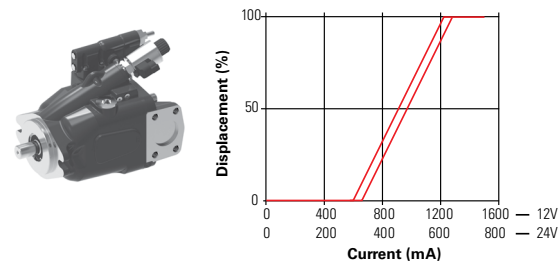
#### Torque control

Limits pump torque to a set maximum.



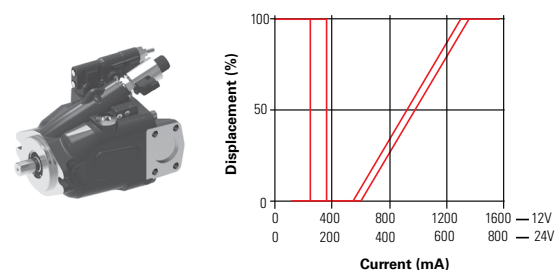
#### Electronic proportional pressure control

Controls displacement proportional to current signal. EP - Return to min. displacement in case of power loss



#### Electronic displacement control

EPD - Return to max. displacement in case of power loss



## Load sense control

- Tunable to system requirements through orifices in the control
- Compact design: 20mm shorter
- Can be adjusted without leaking and contains an adjustment limit to prevent damage
- Non-removable adjusting screws
- Easier access to load sense bleed down orifice

## 620 Torque control

- Add-on control - No loss or degradation of pressure compensator or load-sense functions
- High-accuracy control based on Danfoss's proven PVH design – the industry benchmark
- Externally adjustable torque setting – No disassembly required
- Hydraulic displacement feedback – Reliable and stable performance

## Inverse proportional pressure control

- Efficient use of power, freeing up horsepower for more productive work
- Eliminate load sense valve section and load sense lines available on all displacements
- Dedicated pump to ensure consistent cooling
- Fail safe functionality

## Electronic displacement control

- Dynamic control based on specific machine needs
- Eliminate load sense line available on all displacements
- Full control over the displacement of the pump
- Allows for great flexibility
- Efficient use of the power available
- Delivers low losses

## Dynamic response per SAE J745 (using swash plate position)

	Response (off stroke)	Recovery (on stroke)	Load sense recovery
	msec	msec	msec
ADU041	20	75	90
ADU049	20	75	90
ADU062	25	90	115
ADU080	26	75	115
	Response (off stroke)	Recovery (on stroke)	Load sense recovery
	msec	msec	msec
ADY074	13	47	84
ADY098	24	68	94

- **Accuracy:** Less than 10% maximum variation across all operating conditions
  - Less than 5% average variation across all operating conditions
- **Packaging:** No increase in length or width; Height increase 40 mm (similar to cold start valve)
- **Setting range:** Fully adjustable from 20%-90% of peak torque, no part changes required

### Electrical data

Voltage	12 V	24 V
Max Current	1500 mA	750 mA
R20, Resistance(ohm)	5.3 +/- 5%	21.2 +/- 5%
Type of Control	Current	Current
Recommended PWM Control Frequency	100 Hz	100 Hz
Duty Cycle	100%	100%
Insulation material	Class H, 180 deg C	Class H, 180 deg C
Protection Class	IP69K/IPX9K	IP69K/IPX9K
Connector	AMP Junior Power Timer/ Deutsch Connector DT04-2P	AMP Junior Power Timer/ Deutsch Connector DT04-2P
Operating Temperature	-30 deg C; 105 deg C	-30 deg C; 105 deg C

### Electrical data

Voltage	12 V DC	24 V DC
Max Current	1500 mA	750 mA
R20, Resistance(ohm)	5.19 +/- 0.52%	20.8 +/- 2.08
Type of Control	Current	Current
Recommended PWM Frequency	250 Hz	250 Hz
Dither Frequency	75 Hz	75 Hz
Dither Amplitude	300 mA	300 mA
Duty Cycle	100%	100%
Insulation material	Class H, 180 deg C	Class H, 180 deg C
Protection Class	IP69K	IP69K
Connector	Deutsch	Deutsch
Operating Temperature	-40 deg C; 85 deg C	-40 deg C; 85 deg C

Danfoss Power Solutions, Nordborgvej 81, 6430 Nordborg, Denmark, Tel. +45 74 88 22 22, Fax +45 74 65 25 80  
www.danfoss.com, E-mail: info@danfoss.com

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