

ENGINEERING  
TOMORROW

*Danfoss*

# iSave 50 and iSave 70 Product Presentation



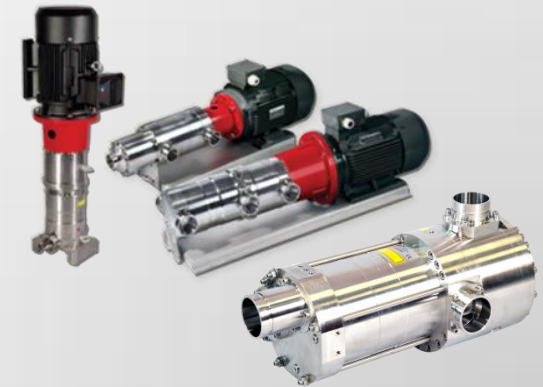
# Danfoss High Pressure Pumps - RO Product Range



High-pressure pumps  
**APP**



High-pressure pumps  
**APP S 674**  
(acc. to API and ATEX)



Energy Recovery Devices  
**iSave**

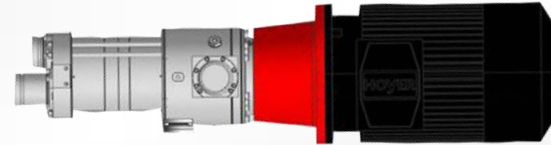
# The Danfoss iSave ERD Range



**New:**

iSave 50

iSave 70



		iSave 21	iSave 40	iSave 50	iSave 70
Flow	m <sup>3</sup> /h gpm	7-21 31-92	21-41 92-180	42-52 184-228	50-70 220-308
Efficiency, isave, motor, VFD	%	88-91	89-92	92-94	91-93
Delta P - max. differential pressure HP in – HP out	barg psig	3 43	5 72	5 72	5 72
Weight	kg lb	65 143	123 271	164 362	164 362
Footprint	m <sup>2</sup> foot <sup>2</sup>	0.38 4.09	0.17-0.54 1.83-5.81	0.44 4.71	0.44 4.71
Connections		2" Vic.	3" Vic.	3" Vic.	3" Vic.

- Materials: Peek, Duplex and Super Duplex
- Frequency converters always required

# New iSave range and new Train sizes

The modular configuration offers a great match with most typical RO train sizes

Pump size	Max. flow		Typical train size		
	m <sup>3</sup> /h	gpm	CMD	gpm	No. of ERDs
iSave 21	21	92	100-400	20-75	1
iSave 40	42	184	350-800	65-150	1
iSave 50 new	52	228	<b>650-1000</b>	<b>120-185</b>	1
iSave 70 new	70	308	<b>750-1350</b>	<b>140-245</b>	1
iSave 50 new x 2	104	458	<b>1250-2000</b>	<b>230-365</b>	2
iSave 70 new x 2	140	616	<b>1500-2700</b>	<b>275-495</b>	2
iSave 70 new x 3	210	925	<b>2200-4100</b>	<b>400-750</b>	3
iSave 70 new x 4	280	1230	<b>3000-5500</b>	<b>550-1000</b>	4
iSave 70 new x 5	350	1540	<b>3700-6900</b>	<b>680-1260</b>	5

# Introducing the new iSave 50 and iSave 70

Pressure: 40-80 barg

Differential pressure: 1-5 barg

iSave 50: 42-52 m<sup>3</sup>/hr

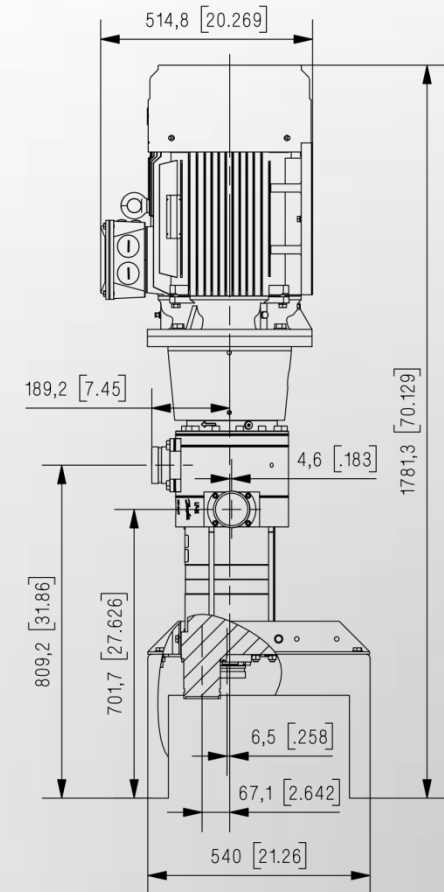
iSave 70: 50-70 m<sup>3</sup>/hr

Efficiency including pump, motor and VFD:

Flow	Expected efficiency*
50 m <sup>3</sup> /hr.	94.0%
68 m <sup>3</sup> /hr.	93.0%

\*) Typical efficiency for pressure exchanger, booster vane pump, electric motor and VFD at max. pressure after a system has been commissioned and run in. The values are based on first articles

*Same outside dimensions for both variants*



# iSave 50 and iSave 70 – What's in it for you:

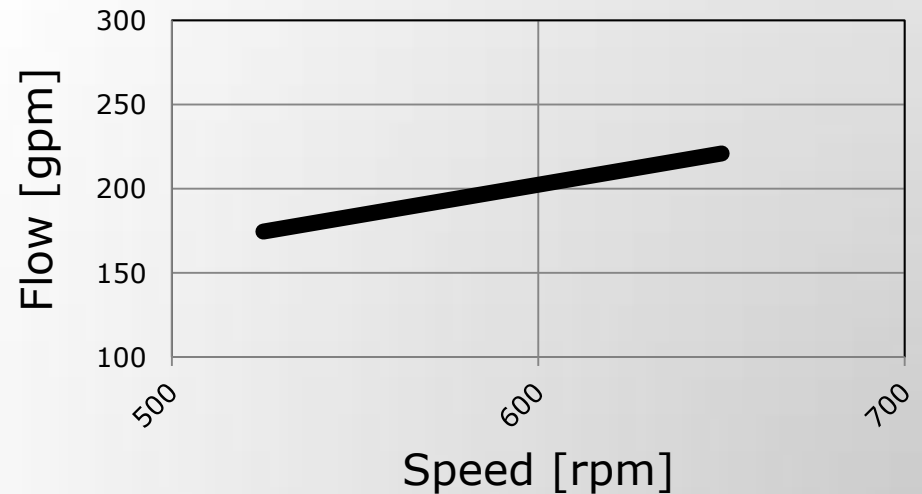
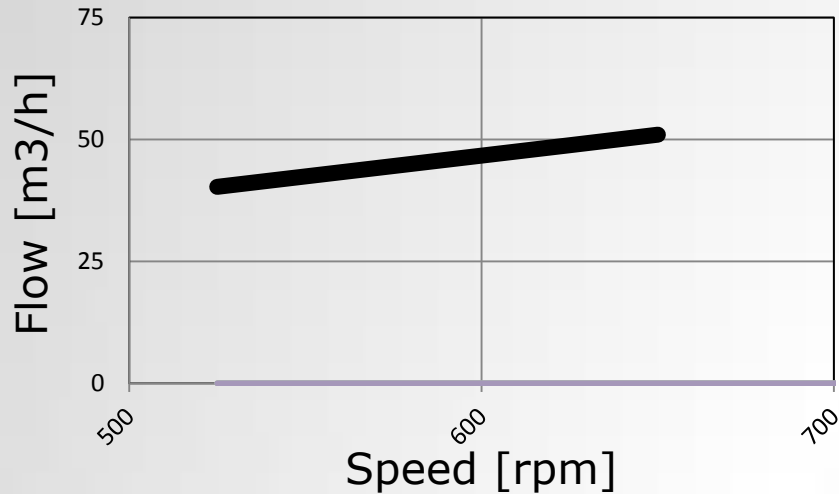


- Energy efficiency in the top of it's game
- When combined with the Danfoss APP high-pressure pumps, unprecedented energy efficiency is achieved
- Space-saving installation with pump and pressure exchanger in one unit
- Simple system design and monitoring without requirement for expensive high-pressure flow meters
- Simple operation with a design that prevents overspin
- Service friendly design
- Inspection intervals 8,000 hours (1 years operation)
- Well-known, proven technology based on the successful iSave 40

**Why accept anything but the lowest energy costs?**

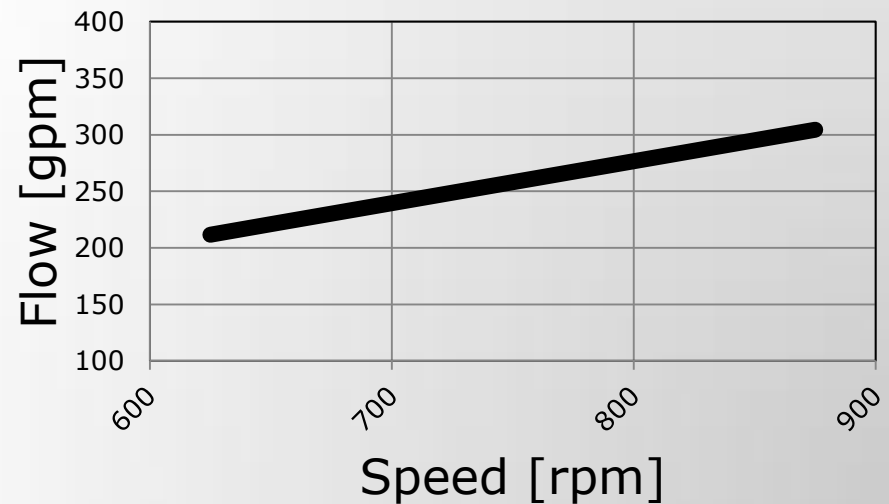
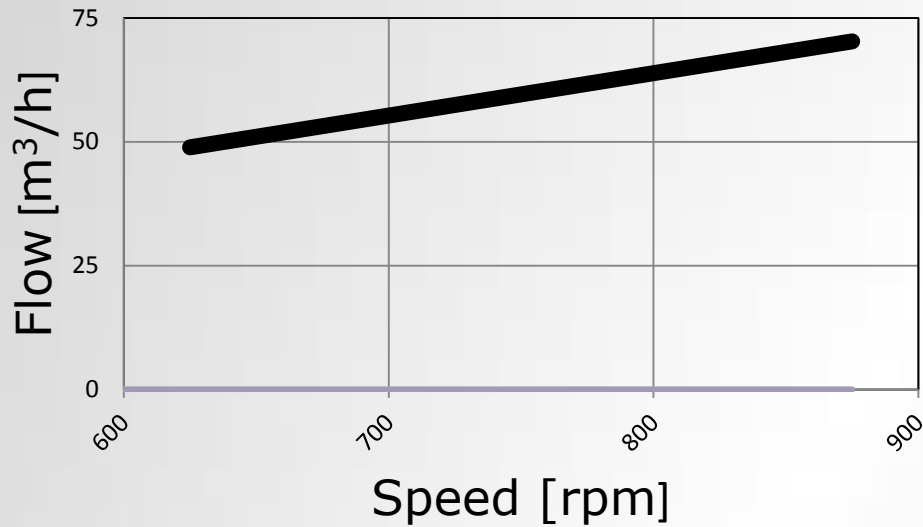
# Key Performance Points for iSave 50

Flow curves @ 2 bar differential pressure



# Key Performance Points for iSave 70

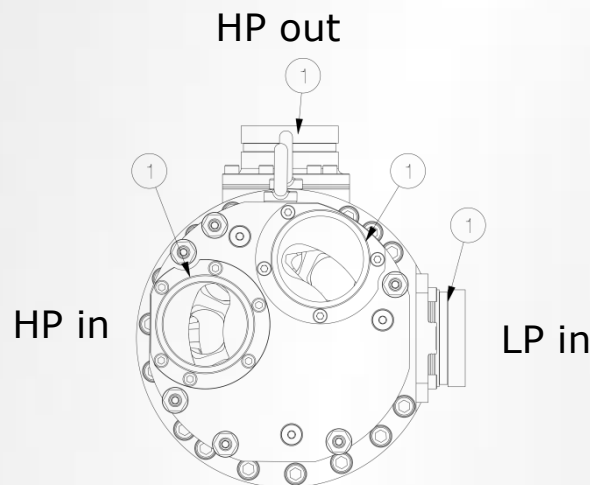
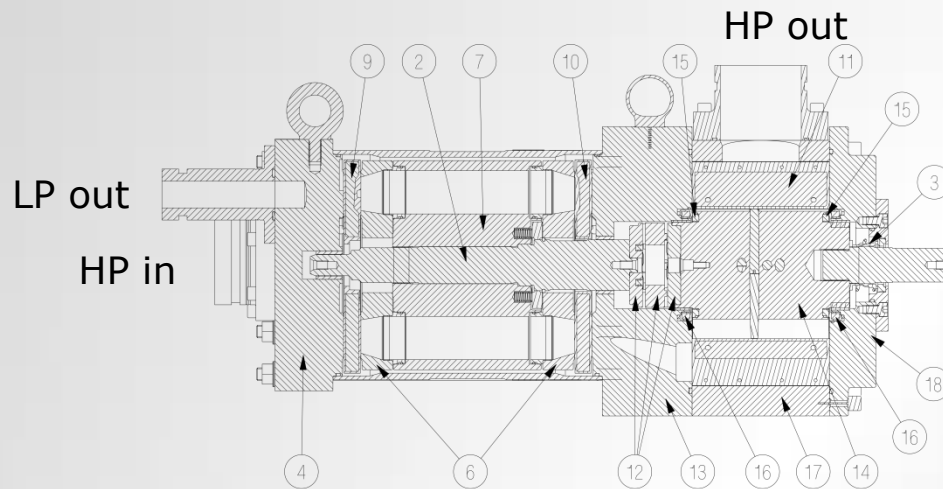
Flow curves @ 2 bar differential pressure





# Terminology

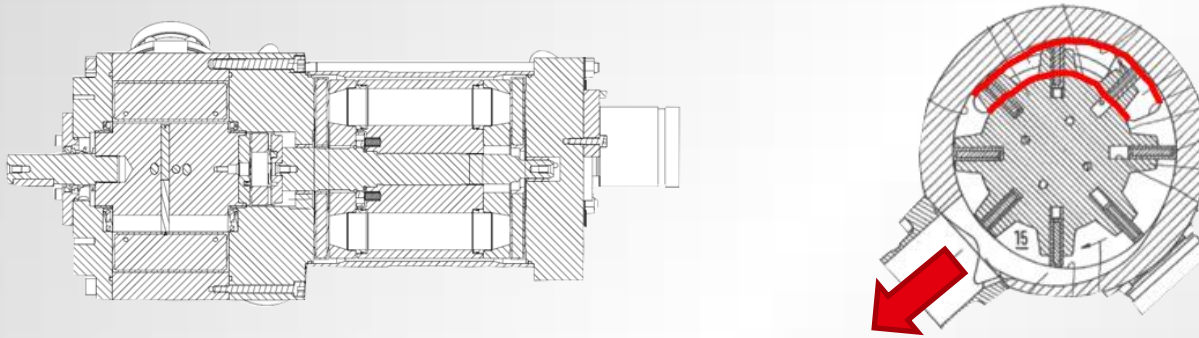
iSave 50-70 parts description



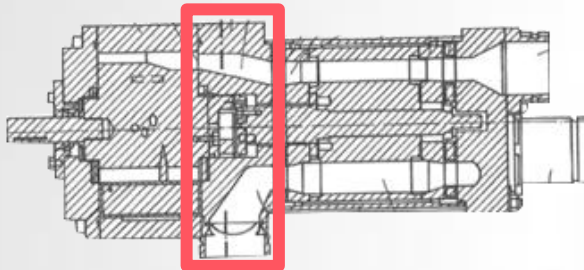
1	3" Victalic connections
2	Shaft
3	Low pressure shaft seal
4	Port flange
6	Valve plate
7	Cylinder barrel
8	Port plate (brine)
9	Port plate (sea water)
11	Vaness
12	Coupling
13	Intermediate flange
14	Rotor
15	Rotor element
16	Sealing plate
17	Stator
18	Motor end flange

# Innovation – uniquely iSave 50-70

- Shape of axial inlet & side port in the vane pump



- One flange connecting vane pump and pressure exchanger



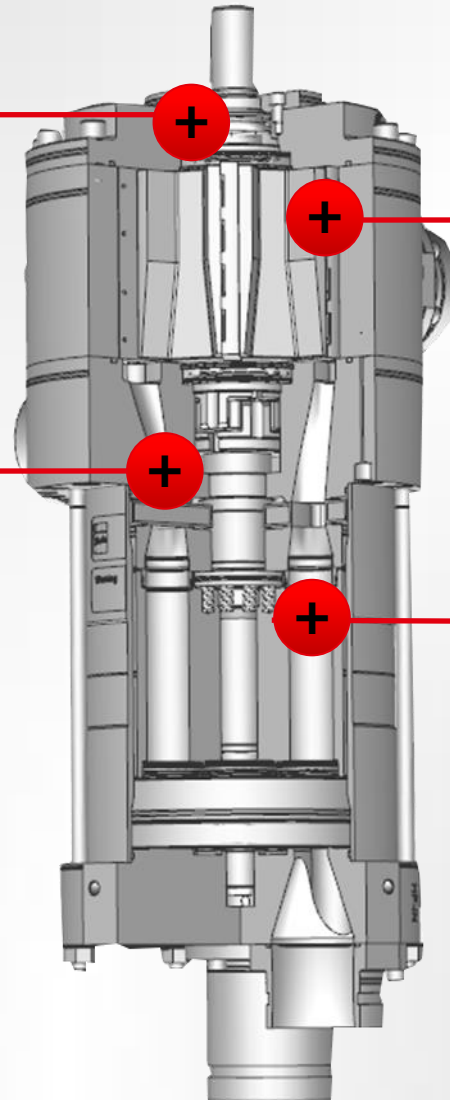
# Advantages of the iSave ERD

## Few moving parts

- Direct driven
- Long time between service
- Simple maintenance
- No High Pressure Shaft Seal

## Combined pressure exchanger and High Pressure Booster Pump in one

- Very compact design
- Fewer components
- Easy to service



## High Pressure Booster Pump

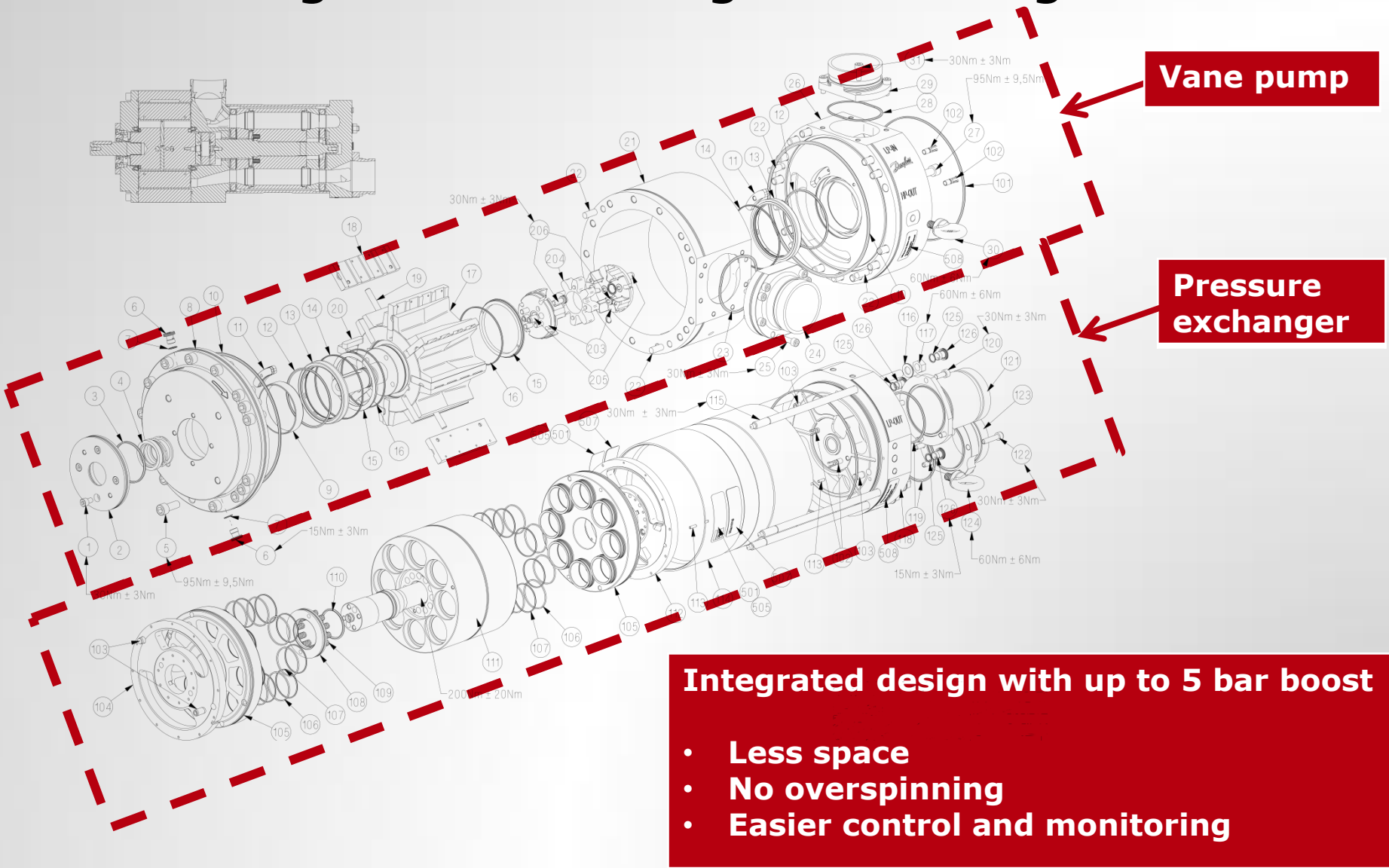
- Constant flow regardless of pressure variations
- Maintains high efficiency at different flows

## Pressure exchanger

- Well tested recovery principle that runs in hundreds of water makers
- High grade duplex and super duplex stainless steel

*Illustration of cut iSave 50*

# Advantages of the integrated Design

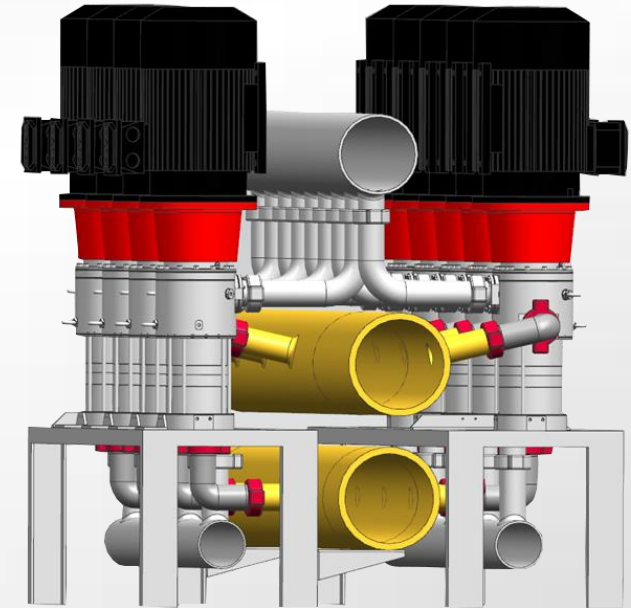
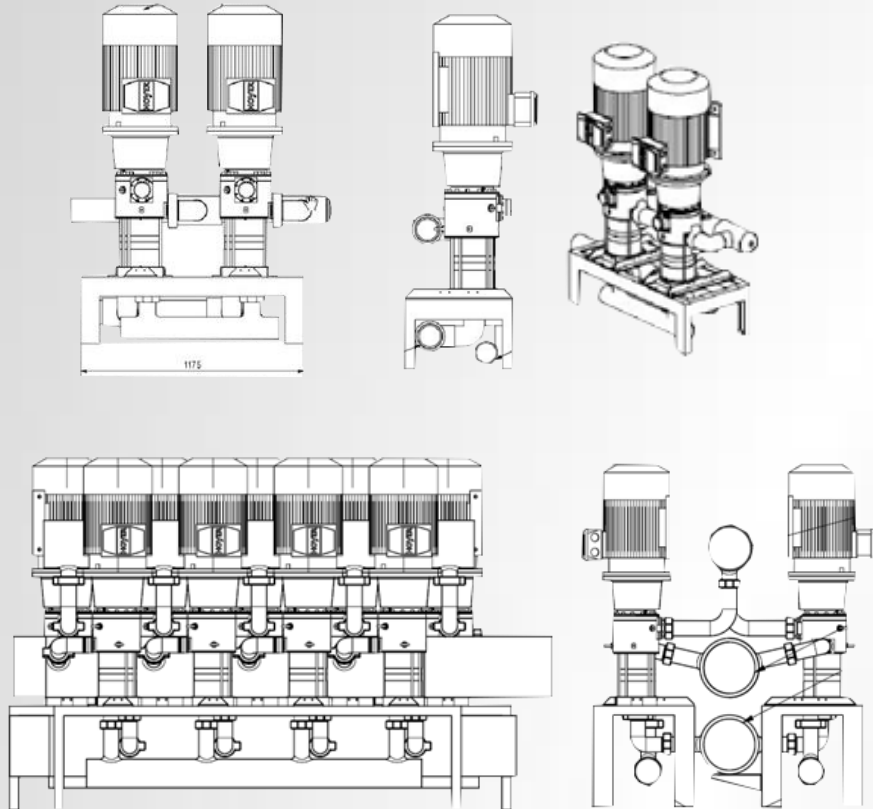


**Integrated design with up to 5 bar boost**

- **Less space**
- **No overspinning**
- **Easier control and monitoring**

# Installation friendly

## Suggested manifold designs



12,400 CMD

Note:  
Find advise in the guideline  
"Parallel-coupled APP pumps  
and iSave ERDs"

# Accessories for iSave 50 and iSave 70

Filters, couplings, base frame

<b>Accessories</b>	
40" Filter House 3 @ vic. Conn.	Non-transparent for OD 6" cartridge
Legs for 40" Filter House	Alu
Filter Cartridge 40", max 60 m <sup>3</sup> /h	40" 10μ absolute, OD 6"
3" Inlet hose kit - 2 m (79") 6 barg (87 psig)	3" victaulic connections
3" Outlet hose - 1 m (39.4") 80 barg (1160 psig)	3" victaulic connections
iSave 50 – 70 coupling	Softex 55H7-32H7
iSave 50 –70 coupling incl. bell housing w/access holes	Alu housing ø 400/204
iSave 50-70 and APP bell housing adapter NEMA	NEMA flange adapter for 30 HP 6 pole NEMA
Base frame for vertical position	Base frame IEC and NEMA
Base frame for horizontal position	Base frame IEC and NEMA

# “Plug and Run” Solutions

## Motors and VFDs

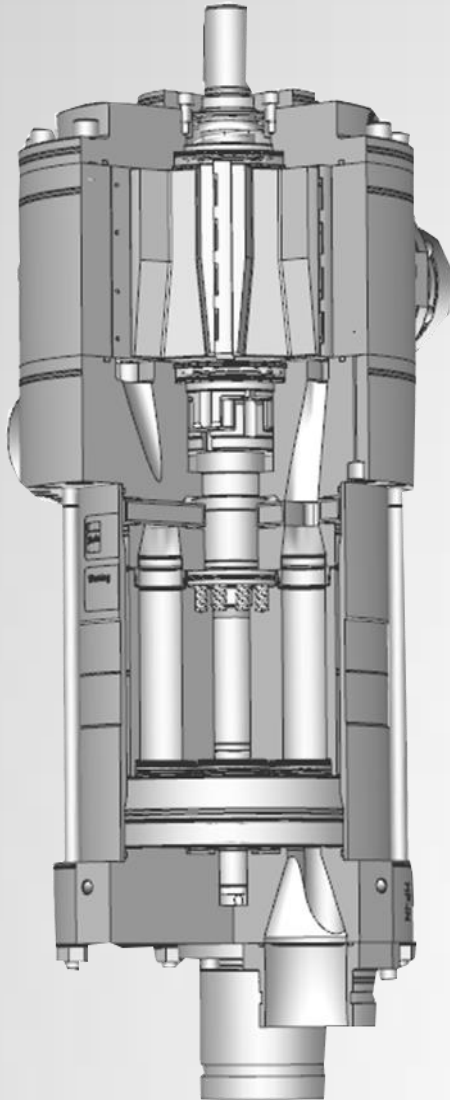
Motor IE3	IEC 200L1 6 pole, 18.5 kW, 3x400 V 50 Hz IE3
Motor NEMA	30 HP 6 pole 1200 3 60 208-230/46 0V NEMA
Frequency converter VLT (18.5 kW)	VLT AQUA Drive FC 202 Advanced 18.5 kW, 3x380-480v, IP55
Frequency converter VLT (22 kW)	VLT AQUA Drive FC 202 Advanced 22 kW, 3x380-480v, IP55

## Assemblies

Complete iSave 50 with motor Vertical or Horizontal	18.5 kW-6p 50 Hz electric motor IE3
Complete iSave 70 with motor, Vertical or Horizontal	18.5 kW-6p 50 Hz electric motor IE3
Complete iSave 50 with motor, Vertical NEMA	30 HP 6p 60 Hz electric motor NEMA
Complete iSave 70 with motor, Vertical NEMA	30 HP 6p 60 Hz electric motor NEMA



# Lifting and Service



One qualified operator can carry out onsite service

Service is carried out in vertical position with lifting equipment

Easy disassembly & assembly

First wear parts recommended for replacement after 2 years



Simple pulley



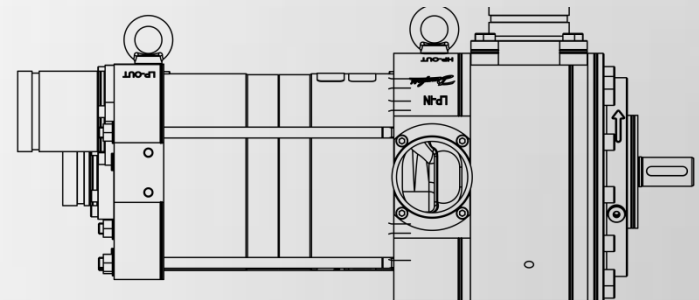
Few service kits



# Spare parts for iSave 50 and iSave 70

Spare part kits	
Complete	Tool kit
Complete	Seal kit – inspections
Complete	Shaft seal kit
Complete	Coupling kit
PE	Valve plates kit
PE	Port plates kits
Pump	Vanes kit
Pump	Rotor elements and sealing plates kit (2 sets)

The kits contain necessary seals and fasteners for that particular service task



# Spare Parts – recommended Service Intervals

Spare part kits iSave 50-70		Year 1 Pcs	Year 2 Pcs	Year 3 Pcs	Year 4 Pcs	Year 5 Pcs
iSave 50-70	Tool kit iSave	1	0	0	0	0
iSave 50-70	Inspection seal kit*	1	1	1	1	1
iSave 50-70	Shaft seal kit with o-rings	0	0	0	0	1
iSave 50-70	Coupling kit with spidex and o-rings	0	0	0	0	1
iSave 50	Port plates kit PE iSave 50 with o-rings	0	1	0	1	0
iSave 70	Port plates kit PE iSave 70 with o-rings	0	1	0	1	0
iSave 50-70	Vanes kit – vanes only	0	0	1	0	0

*\*The "inspection seal kit" is an affordable kit with only the basic O-rings and fasteners required for the yearly inspection task*

Service intervals require full compliance of specifications and recommended filtration

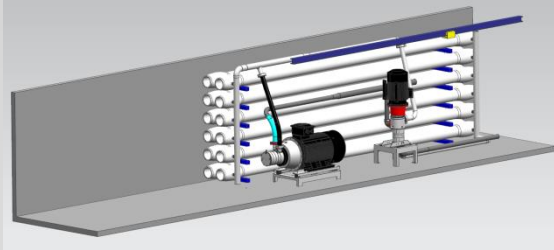
# iSave matched with APP

Wide choice and modularity make a great match with typical train sizes

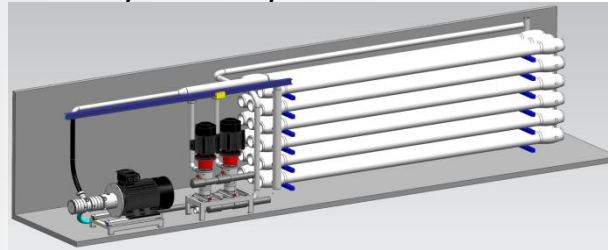
Pump	ERD	Train size			
		No. of pumps	No. of ERDs	CMD	GPM
APP 38	iSave 50 NEW	1-2	1-2	750-1700	150-300
APP 43	iSave 50 NEW	1-2	1-2	950-2000	175-350
APP 53 NEW	iSave 70 NEW	1	1	1050-1200	195-220
APP 65 NEW	iSave 70 NEW	1	1	1250-1350	230-250
APP 65 NEW	iSave 50 NEW	1	2	1400-1500	255-275
APP 78 NEW	iSave 50 NEW	1	2	1600-1800	295-330
APP 86 NEW	iSave 50 NEW	1	2	1850-2000	340-365
APP 86 NEW	iSave 70 NEW	1	2	1850-2000	340-365
APP 53 NEW	iSave 70 NEW	2	2	2100-2400	385-440
APP 78 NEW	iSave 70 NEW	2	2-3	2500-3600	460-660
APP 86 NEW	iSave 70 NEW	2-5	3-8	3700-10000	680-1835

# Mix and Match Configurations (examples)

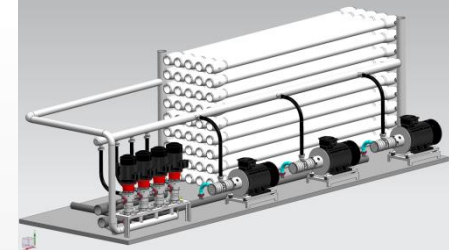
1,000 CMD



1,800-2,000 CMD



5,000 CMD



CMD	Recovery rates	Configuration
1,000	38-44%	1 x iSave 70 1 x APP 43
1,800	42-45%	2 x iSave 50 1 x APP 78
2,000	38-45%	2 x iSave 70 1 x APP 86
5,000	43-45%	4 x iSave 70 3 x APP 78

# Sales Support Material

- Animation – available website:

<http://high-pressurepumps.danfoss.com/products/energy-recovery-devices/isave-erd/>

- Data sheet – available on website:

<http://high-pressurepumps.danfoss.com/products/energy-recovery-devices/isave-erd/>

- Guideline for Parallel-coupled APPs and iSaves, 180R9354 available on x drive:

X:\RC\DKRC\Marketing\HPP\_Literature\Instructions\1\_APP\_APP S\_ APP S 674 pumps\_APP W\180R9354\_521B1379\_DKCFN.PI.003.2A.02\_Parallel coupled APP\_UK

- Online catalogue will soon go live – a mail will be sent out
- iSave selection tool – has been sent out to all
- Drawings (2D, 3D, illustrations) – available on website:

<http://high-pressurepumps.danfoss.com/products/energy-recovery-devices/isave-erd/>

Brochure on iSave, 521B1184 – available on website:

<http://high-pressurepumps.danfoss.com/products/energy-recovery-devices/isave-erd/>

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