

# Products Cryo Pumps

## Cryo Pumps with fully Automatic Control, iClassicLine COOLVAC 1500 iCL

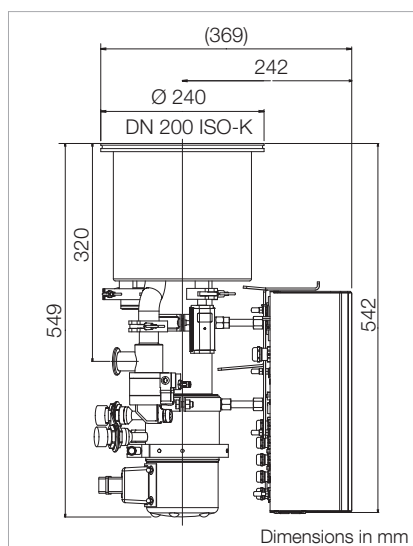


### Advantages to the User

- Hydrocarbon-free high vacuum
- High capacity for argon and hydrogen
- High crossover value
- Simple operation
- Trouble-free integration into complex systems
- Fully automatic regeneration through Cryo Compact Control <sup>1)</sup>
- Easy servicing

### Typical Applications

- Evaporators
- Sputtering systems
- Ion implanters
- Optical coating systems
- Metallization systems



Dimensional drawing for the COOLVAC 1500 iCL (DN 200 ISO-K)

### Technical Data

### COOLVAC 1500 iCL

High vacuum (HV) flange	DN	200 ISO-K / 200 CF / 6" ANSI
Fore vacuum flange <sup>2)</sup>	DN	25 ISO-KF
Flange for connection a gauge head <sup>3)</sup>	DN	16 ISO-KF
Flange for the electrical connection	DN	16 ISO-KF
Pressure-relief device with flange connection for gas exhaust line	DN	40 ISO-KF
4-way current feedthrough for Si diode on a flange	DN	16 ISO-KF
<b>Heaters</b>		
1st stage	W	160
	V AC	42
2nd stage	W	90
	V AC	42
<b>Temperature sensor</b>		
1st stage		PT 100
2nd stage		Si-Diode
Built-in cold head	COOLPOWER	7/25
Weight	kg (lbs)	25 (55.1)
Cooldown time to T <sub>2</sub> = 20 K	min	60
Crossover value	mbar x l (Torr x l)	210 (155)
<b>Pumping speed</b>		
H <sub>2</sub> O	l/s	4600 ± 10%
Ar / N <sub>2</sub>	l/s	1200 / 1500 ± 10%
H <sub>2</sub>	l/s	2500 ± 10%
<b>Capacity</b>		
Ar / N <sub>2</sub>	bar x l	1000 / 1000
H <sub>2</sub> at 10 <sup>-6</sup> mbar	bar x l	15 <sup>4)</sup>
<b>Max. throughput</b>		
Ar / N <sub>2</sub>	mbar x l/s (Torr x l/s)	12 (9) / 12 (9)
H <sub>2</sub>	mbar x l/s (Torr x l/s)	6 (4.5) <sup>4)</sup>
Helium connections	DN	1/2"
<b>(Self-sealing couplings: outside thread, type 5400-S2-8)</b>		

1) Accessories, necessary for automatic operations (i.e. electrical regeneration heaters, forevacuum valve DN 25 ISO-KF, and vacuum gauge DN 16 ISO-KF), are included with the scope of delivery and are connected to the integrated COOL.DRIVE.

2) Electropneumatic angle valve included.

3) Vacuum gauge head included.

4) The maximum throughput values given for hydrogen (H<sub>2</sub>) are true for regenerated cryo pumps under short-term loads only. For continuous operations, both throughput and capacity values will be lower.

## Ordering Information

## COOLVAC 1500 iCL

	Single Operation		Dual operation		Multiple operation	
	Europe	USA/Japan	High Voltage	Low Voltage	High Voltage	Low Voltage
	Part No.		Part No.		Part No.	
COOLVAC 1500 iCL						
DN 200 CF	844201V0002		844201V0002 (2x)		844201V0002 (3x)	
DN 6" ANSI	844201V0004		844201V0004 (2x)		844201V0004 (3x)	
DN 200 ISO-K	844201V0006		844201V0006 (2x)		844201V0006 (3x)	

### Compressors, flexlines and cables

Compressor						
CP 2000	840000V2000	-	-	-	-	-
CP 2200	-	840000V2200	-	-	-	-
CP 6000 H	-	-	840000V6001	-	840000V6001	-
CP 6200 H	-	-	-	840000V6201	-	840000V6201
Power supply cable for compressor	-		see Ordering Information of the compressor units			
Set of flexlines						
FL 4.5 (1/2", 1/2")	892 87		892 87 (2x)		892 87 (3x)	
or FL 9.0 (1/2", 1/2")	892 88		892 88 (2x)		892 88 (3x)	
or FL 18.0 HP (1/2") + FL 18.0 LP (1/2")	840203 + 840204		840203 (2x) + 840204 (2 x)		840203 (3x) + 840204 (3 x)	
Gas manifold (1 piece each)						
GD 2	-		840 253 (2x)		-	
GD 4	-		-		840 254 (2x)	
Compressor unit control cable <sup>1)</sup>						
COOLPAK control cable, 5 m (16.4 ft)	844231V4005		844231V4005 (2x)		844231V4005 (3x)	
or COOLPAK control cable, 10 m (32.81 ft)	844231V4010		844231V4010 (2x)		844231V4010 (3x)	
or COOLPAK control cable, 20 m (65.62 ft)	844231V4020		844231V4020 (2x)		844231V4020 (3x)	
COOLPAK adapter for multi control	-		844231V5003		844231V5003	

### Optional electronics, cables and equipment

CRYOVISION control and display unit	844231V0002		844231V0002		844231V0002	
CRYOVISION control cables						
CRYOVISION control cable, 5 m (16.4 ft)	844231V2005		844231V2005		844231V2005	
or CRYOVISION control cable, 10 m (32.81 ft)	844231V2010		844231V2010		844231V2010	
or CRYOVISION control cable, 20 m (65.62 ft)	844231V2020		844231V2020		844231V2020	
Network control cable for the link between the pumps						
CRYOVISION / Network control cable, 5 m (16.4 ft)	-		844231V2005		844231V2005 (2x)	
or CRYOVISION / Network control cable, 10 m (32.81 ft)	-		844231V2010		844231V2010 (2x)	
or CRYOVISION / Network control cable, 20 m (65.62 ft)	-		844231V2020		844231V2020 (2x)	

### Optional interface module

COOLVAC ProfiBus module ProfiBus – RS232 Converter for COOL.DRIVE and CRYOVISION either COOLVAC ProfiBus module connected to COOL.DRIVE control and monitoring unit of each cryo pump (in this case CRYOVISION and network control not to apply)	844000V1		844000V1 (2x)		844000V1 (3x)	
or COOLVAC ProfiBus module connected to CRYOVISION <sup>2)</sup>	844000V1		844000V1		844000V1	

The arrangement of the components is shown in the chapter "Accessories" under the heading "iCOOLVAC iClassicLine, System Components".

1) The length of the control cable should match to the length of the flexlines.

2) At multiple operation with reduced communication speed to single cryo pumps.

# COOLVAC 2000 iCL

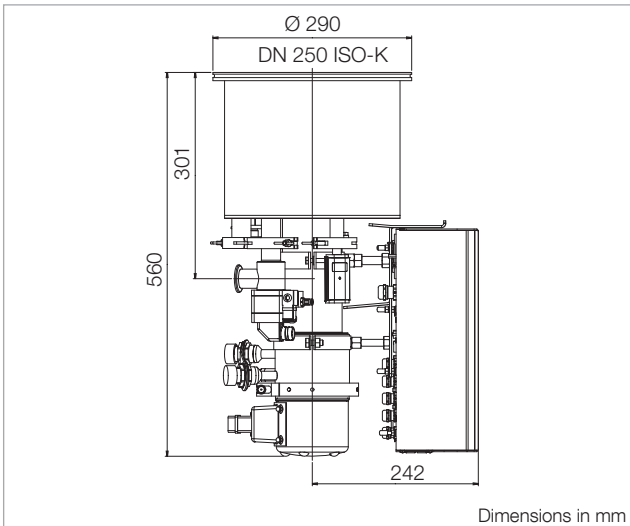


## Advantages to the User

- Hydrocarbon-free high vacuum
- High capacity for argon and hydrogen
- High crossover value
- Simple operation
- Trouble-free integration into complex systems
- Fully automatic regeneration through integrated COOL.DRIVE controller <sup>1)</sup>
- Easy on-site servicing without pump disassembling and reconditioning of the vacuum system possible

## Typical Applications

- Evaporators
- Sputtering systems
- Ion implanters
- Optical coating systems
- Metallization systems



Dimensional drawing for the COOLVAC 2000 iCL (DN 250 ISO-K)

# COOLVAC 3000 iCL

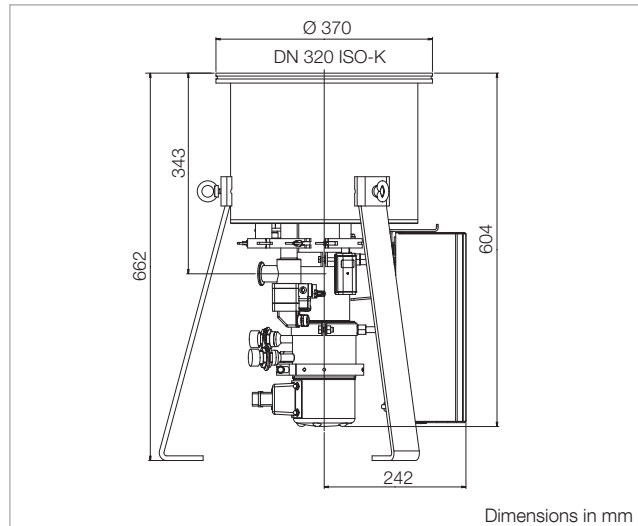


## Advantages to the User

- Hydrocarbon-free high vacuum
- High capacity for argon and hydrogen
- High crossover value
- Simple operation
- Trouble-free integration into complex systems
- Fully automatic regeneration through integrated COOL.DRIVE controller <sup>1)</sup>
- Easy on-site servicing without pump disassembling and reconditioning of the vacuum system possible

## Typical Applications

- Evaporators
- Sputtering systems
- Ion implanters
- Optical coating systems
- Metallization systems



Dimensional drawing for the COOLVAC 3000 iCL (DN 320 ISO-K)

## Technical Data

## COOLVAC

		2000 iCL	3000 iCL
High vacuum (HV) flange	DN	250 ISO-K / 250 CF / 8" ANSI	320 ISO-K / 10" ANSI
Fore vacuum flange <sup>2)</sup>	DN	25 ISO-KF	25 ISO-KF
Flange for connection a gauge head <sup>3)</sup>	DN	16 ISO-KF	16 ISO-KF
Flange for the electrical connection	DN	16 CF	16 CF
Pressure-relief device with flange connection for gas exhaust line	DN	40 ISO-KF	40 ISO-KF
4-way current feedthrough for Si diode on a flange	DN	16 ISO-KF	16 ISO-KF
<b>Heaters</b>			
1st stage	W	160	160
	V AC	42	42
2nd stage	W	90	90
	V AC	42	42
<b>Temperature sensor</b>			
1st stage		Pt100	Pt100
2nd stage		Si diode	Si diode
Built-in cold head	COOLPOWER	7/25	7/25
Weight	kg (lbs)	29 (64)	35 (101.4)
Cooldown time to T <sub>2</sub> = 20 K	min	70	120
Crossover value	mbar x l (Torr x l)	250 (187)	500 (375)
<b>Pumping speed</b>			
H <sub>2</sub> O	l/s	7000	10500
Ar / N <sub>2</sub>	l/s	1600 / 2100	2500 / 3000
H <sub>2</sub>	l/s	3200	6000
<b>Capacity</b>			
Ar / N <sub>2</sub>	bar x l	1600 / 1600	2500 / 2500
H <sub>2</sub> at 10 <sup>-6</sup> mbar	bar x l	15 <sup>4)</sup>	28 <sup>4)</sup>
<b>Max. throughput</b>			
Ar / N <sub>2</sub>	mbar x l/s (Torr x l/s)	12 (9) / 12 (9)	15 (11.2) / 15 (11.2)
H <sub>2</sub>	mbar x l/s (Torr x l/s)	6 (4.5) <sup>4)</sup>	10 (7.5) <sup>4)</sup>
Helium connections (Self-sealing couplings: outside thread, type 5400-S2-8)	DN	1/2"	1/2"

- 1) Accessories, necessary for automatic operations (i.e. electrical regeneration heaters, forevacuum valve DN 25 ISO-KF, and vacuum gauge DN 16 ISO-KF), are included with the scope of delivery and are connected to the integrated COOL.DRIVE.
- 2) Electropneumatic angle valve included.
- 3) Vacuum gauge head included.
- 4) The maximum throughput values given for hydrogen (H<sub>2</sub>) are true for regenerated cryo pumps under short-term loads only. For continuous operations, both throughput and capacity values will be lower.

## Ordering Information

## COOLVAC 2000 iCL

	Single Operation		Dual operation		Multiple operation	
	Europe	USA/Japan	High Voltage	Low Voltage	High Voltage	Low Voltage
	Part No.		Part No.		Part No.	
COOLVAC 2000 iCL						
DN 250 CF	844251V0002		844251V0002 (2x)		844251V0002 (3x)	
DN 8" ANSI	844251V0004		844251V0004 (2x)		844251V0004 (3x)	
DN 250 ISO-K	844251V0006		844251V0006 (2x)		844251V0006 (3x)	

### Compressors, flexlines and cables

Compressor						
CP 2000	840000V2000	-	-	-	-	-
CP 2200	-	840000V2200	-	-	-	-
CP 6000 H	-	-	840000V6001	-	840000V6001	-
CP 6200 H	-	-	-	840000V6201	-	840000V6201
Power supply cable for compressor	-		see Ordering Information of the compressor units			
Set of flexlines						
FL 4.5 (1/2", 1/2")	892 87		892 87 (2x)		892 87 (3x)	
or FL 9.0 (1/2", 1/2")	892 88		892 88 (2x)		892 88 (3x)	
or FL 18.0 HP (1/2") + FL 18.0 LP (1/2")	840203 + 840204		840203 (2x) + 840204 (2 x)		840203 (3x) + 840204 (3 x)	
Gas manifold (1 piece each)						
GD 2	-		840 253 (2x)		-	
GD 4	-		-		840 254 (2x)	
Compressor unit control cable <sup>1)</sup>						
COOLPAK control cable, 5 m	844231V4005		844231V4005 (2x)		844231V4005 (3x)	
or COOLPAK control cable, 10 m	844231V4010		844231V4010 (2x)		844231V4010 (3x)	
or COOLPAK control cable, 20 m	844231V4020		844231V4020 (2x)		844231V4020 (3x)	
COOLPAK adapter for multi control	-		844231V5003		844231V5003	

### Optional electronics, cables and equipment

CRYOVISION control and display unit	844231V0002		844231V0002		844231V0002	
CRYOVISION control cables						
CRYOVISION control cable, 5 m	844231V2005		844231V2005		844231V2005	
or CRYOVISION control cable, 10 m	844231V2010		844231V2010		844231V2010	
or CRYOVISION control cable, 20 m	844231V2020		844231V2020		844231V2020	
Network control cable for the link between the pumps						
CRYOVISION / Network control cable, 5 m	-		844231V2005		844231V2005 (2x)	
or CRYOVISION / Network control cable, 10 m	-		844231V2010		844231V2010 (2x)	
or CRYOVISION / Network control cable, 20 m	-		844231V2020		844231V2020 (2x)	

### Optional interface module

COOLVAC ProfiBus module ProfiBus – RS232 Converter for COOL.DRIVE and CRYOVISION  either COOLVAC ProfiBus module connected to COOL.DRIVE control and monitoring unit of each cryo pump (in this case CRYOVISION and network control not to apply)	844000V1		844000V1 (2x)		844000V1 (3x)	
or COOLVAC ProfiBus module connected to CRYOVISION <sup>2)</sup>	844000V1		844000V1		844000V1	

The arrangement of the components is shown in the chapter "Accessories" under the heading "COOLVAC iClassicLine, System Components".

1) The length of the control cable should match to the length of the flexlines.

2) At multiple operation with reduced communication speed to single cryo pumps.

## Ordering Information

## COOLVAC 3000 iCL

	Single Operation		Dual operation	
	Europe	USA/Japan	High Voltage	Low Voltage
	Part No.		Part No.	
COOLVAC 3000 iCL				
DN 10" ANSI	844321V0004		844321V0004 (2x)	
DN 320 ISO-K	844321V0006		844321V0006 (2x)	
<b>Compressors, flexlines and cables</b>				
Compressor				
CP 2000	840000V2000	-	-	-
CP 2200	-	840000V2200	-	-
CP 6000 H	-	-	840000V6001	-
CP 6200 H	-	-	-	840000V6201
Power supply cable for compressor	-		see Ordering Information of the compressor units	
Set of flexlines				
FL 4.5 (1/2", 1/2")	892 87		892 87 (2x)	
or FL 9.0 (1/2", 1/2")	892 88		892 88 (2x)	
or FL 18.0 HP (1/2") + FL 18.0 LP (1/2")	840203 + 840204		840203 (2x) + 840204 (2 x)	
Gas manifold (1 piece each)				
GD 2	-		840 253 (2x)	
Compressor unit control cable <sup>1)</sup>				
COOLPAK control cable, 5 m (16.4 ft)	844231V4005		844231V4005 (2x)	
or COOLPAK control cable, 10 m (32.81 ft)	844231V4010		844231V4010 (2x)	
or COOLPAK control cable, 20 m (65.62 ft)	844231V4020		844231V4020 (2x)	
COOLPAK adapter for multi control	-		844231V5003	
<b>Optional electronics, cables and equipment</b>				
CRYOVISION control and display unit	844231V0002		844231V0002	
CRYOVISION control cables				
CRYOVISION control cable, 5 m (16.4 ft)	844231V2005		844231V2005	
or CRYOVISION control cable, 10 m (32.81 ft)	844231V2010		844231V2010	
or CRYOVISION control cable, 20 m (65.62 ft)	844231V2020		844231V2020	
Network control cable for the link between the pumps				
CRYOVISION / Network control cable, 5 m (16.4 ft)	-		844231V2005	
or CRYOVISION / Network control cable, 10 m (32.81 ft)	-		844231V2010	
or CRYOVISION / Network control cable, 20 m (65.62 ft)	-		844231V2020	
<b>Optional interface module</b>				
COOLVAC ProfiBus module ProfiBus – RS232 Converter for COOL.DRIVE and CRYOVISION  either COOLVAC ProfiBus module connected to COOL.DRIVE control and monitoring unit of each cryo pump (in this case CRYOVISION and network control not to apply)	844000V1		844000V1 (2x)	
or COOLVAC ProfiBus module connected to CRYOVISION <sup>2)</sup>	844000V1		844000V1	

The arrangement of the components is shown in the chapter "Accessories" under the heading "COOLVAC iClassicLine, System Components".

1) The length of the control cable should match to the length of the flexlines.

2) At multiple operation with reduced communication speed to single cryo pumps.

# COOLVAC 5000 iCL

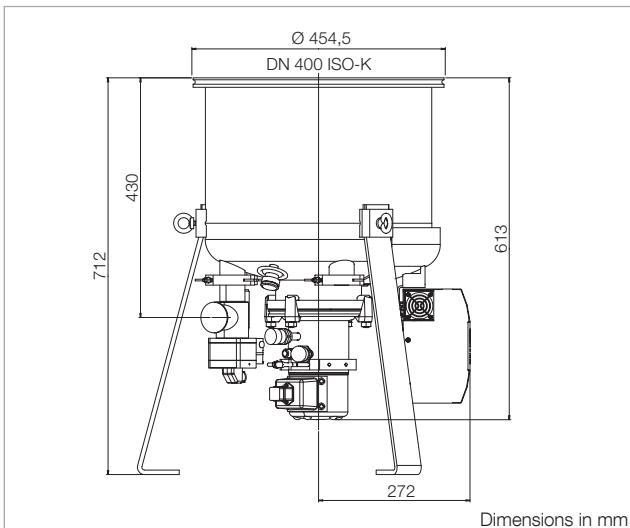


## Advantages to the User

- Hydrocarbon-free high vacuum
- High capacity for argon and hydrogen
- High crossover value
- Simple operation
- Trouble-free integration into complex systems
- Fully automatic regeneration through integrated COOL.DRIVE controller <sup>1)</sup>
- Easy on-site servicing without pump disassembling and reconditioning of the vacuum system possible

## Typical Applications

- Evaporators
- Electron beam welding systems
- Ion implanters
- Optical coating systems
- Metallization systems



Dimensional drawing for the COOLVAC 5000 iCL

# COOLVAC 10000 iCL

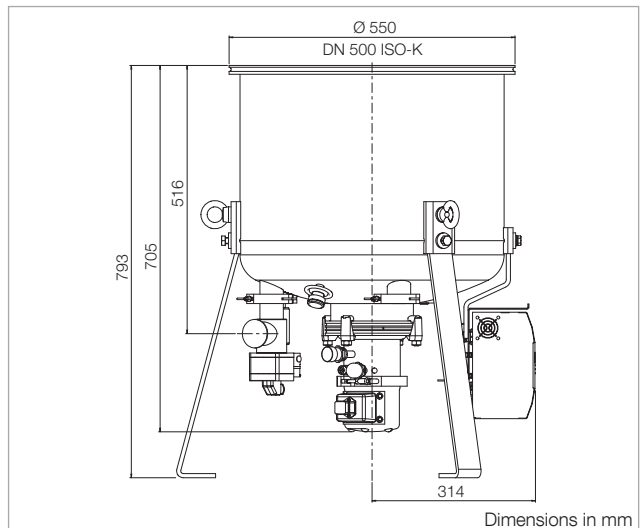


## Advantages to the User

- Hydrocarbon-free high vacuum
- High capacity for argon and hydrogen
- High crossover value
- Simple operation
- Trouble-free integration into complex systems
- Fully automatic regeneration through integrated COOL.DRIVE controller <sup>1)</sup>
- Easy on-site servicing without pump disassembling and reconditioning of the vacuum system possible

## Typical Applications

- Evaporators
- Electron beam welding systems
- Ion implanters
- Optical coating systems
- Metallization systems



Dimensional drawing for the COOLVAC 10000 iCL

## Technical Data

## COOLVAC

### 5000 iCL

### 10000 iCL

High vacuum (HV) flange	DN	400 ISO-K	500 ISO-K / 500 – 20" ANSI
Fore vacuum flange <sup>2)</sup>	DN	40 ISO-KF	40 ISO-KF
Flange for connection of a gauge head <sup>3)</sup>	DN	16 ISO-KF	16 ISO-KF
Flange for the electrical connection	DN	40 ISO-KF	40 ISO-KF
Pressure-relief device with flange connection for gas exhaust line	DN	40 ISO-KF	40 ISO-KF
4-way current feedthrough for Si diode on a flange	DN	16 ISO-KF	16 ISO-KF
<b>Heaters</b>			
1st stage	W	160	160
	V AC	42	42
2nd stage	W	90	90
	V AC	42	42
<b>Temperature sensor</b>			
1st stage		Pt100	Pt100
2nd stage		Si diode	Si diode
Built-in cold head	COOLPOWER	5/100	5/100
Weight	kg (lbs)	53 (116.9)	70 (154.3)
Cooldown time to T <sub>2</sub> = 20 K	min	100	150
Crossover value	mbar x l (Torr x l)	700 (525)	800 (600)
<b>Pumping speed</b>			
H <sub>2</sub> O	l/s	18000	30000
Ar / N <sub>2</sub>	l/s	4000 / 5200	8400 / 10000
H <sub>2</sub>	l/s	6200	10000
<b>Capacity</b>			
Ar / N <sub>2</sub>	bar x l	3000 / 3000	5500 / 5500
H <sub>2</sub> at 10 <sup>-6</sup> mbar	bar x l	32 <sup>4)</sup>	45 <sup>4)</sup>
<b>Max. throughput</b>			
Ar / N <sub>2</sub>	mbar x l/s (Torr x l/s)	10 (7.5) / 10 (7.5)	10 (7.5) / 10 (7.5)
H <sub>2</sub>	mbar x l/s (Torr x l/s)	7 (5.3) <sup>4)</sup>	7 (5.3) <sup>4)</sup>
Helium connection (Self-sealing couplings: outside thread, types 5400-S2-8	DN	1/2"	1/2"

- 1) Accessories, necessary for automatic operations (i.e. electrical regeneration heaters, forevacuum valve DN 25 ISO-KF, and vacuum gauge DN 16 ISO-KF), are included with the scope of delivery and are connected to the integrated COOL.DRIVE.
- 2) Electropneumatic angle valve included.
- 3) Vacuum gauge head included.
- 4) The maximum throughput values given for hydrogen (H<sub>2</sub>) are true for regenerated cryo pumps under short-term loads only. For continuous operations, both throughput and capacity values will be lower.

## Ordering Information

### COOLVAC 5000 iCL

### COOLVAC 10000 iCL

	High Voltage	Low Voltage	High Voltage	Low Voltage
	<b>Part No.</b>		<b>Part No.</b>	
COOLVAC 5000 iCL, DN 400 ISO-K	844411V0006		-	
COOLVAC 10000 iCL, DN 500 20" ANSI	-		844511V0004	
COOLVAC 10000 iCL, DN 500 ISO-K	-		844511V0006	

#### Compressors, flexlines and cables

Compressor	High Voltage	Low Voltage	High Voltage	Low Voltage
CP 6000 H	840000V6001	-	840000V6001	-
CP 6200 H	-	840000V6201	-	840000V6201
Power supply cable for compressor	see Ordering Information of the compressor units			
Set of flexlines				
FL 4.5 (1/2", 1/2")	892 87		892 87	
or FL 9.0 (1/2", 1/2")	892 88		892 88	
or FL 18.0 HP (1/2") + FL 18.0 LP (1/2")	840203 + 840204		840203 + 840204	
Compressor unit control cable <sup>1)</sup>				
COOLPAK control cable, 5 m (16.4 ft)	844231V4005		844231V4005	
or COOLPAK control cable, 10 m (32.81 ft)	844231V4010		844231V4010	
or COOLPAK control cable, 20 m (65.62 ft)	844231V4020		844231V4020	

#### Optional electronics, cables and equipment

CRYOVISION control and display unit	844231V0002	844231V0002
CRYOVISION control cables		
CRYOVISION control cable, 5 m (16.4 ft)	844231V2005	844231V2005
or CRYOVISION control cable, 10 m (32.81 ft)	844231V2010	844231V2010
or CRYOVISION control cable, 20 m (65.62 ft)	844231V2020	844231V2020

#### Optional interface module

COOLVAC ProfiBus module ProfiBus – RS232 Converter for COOL.DRIVE and CRYOVISION	844000V1	844000V1
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The arrangement of the components is shown in the chapter "Accessories" under the heading "COOLVAC iClassicLine, System Components".

1) The length of the control cable should match to the length of the flexlines.



# COOLVAC 18000 iCL



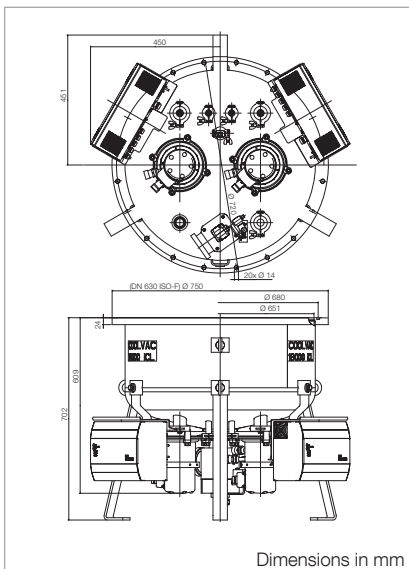
COOLVAC 18000 iCL with flange DN 630 ISO-F

### Advantages to the User

- Hydrocarbon-free high vacuum
- High pumping speed for water vapor and nitrogen
- Fast, safe and efficient regeneration with the electric regeneration system <sup>1)</sup>
- Simple operation

### Typical Applications

- Space simulation chambers
- Evaporators
- Electron beam welding systems
- Optical coating systems
- Metallization systems



Dimensional drawing for the COOLVAC 18000 iCL

# COOLVAC 30000 iCL



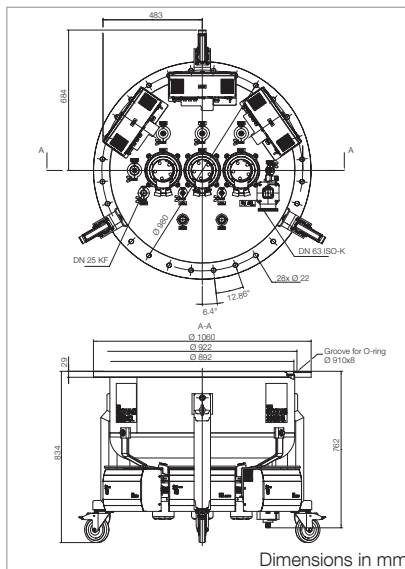
COOLVAC 30000 iCL with special flange

### Advantages to the User

- Hydrocarbon-free high vacuum
- High pumping speed for water vapor and nitrogen
- Fast, safe and efficient regeneration with the electric regeneration system <sup>1)</sup>
- Simple operation

### Typical Applications

- Space simulation chambers
- Evaporators
- Electron beam welding systems
- Optical coating systems
- Metallization systems



Dimensional drawing for the COOLVAC 30000 iCL

# COOLVAC 60000 iCL



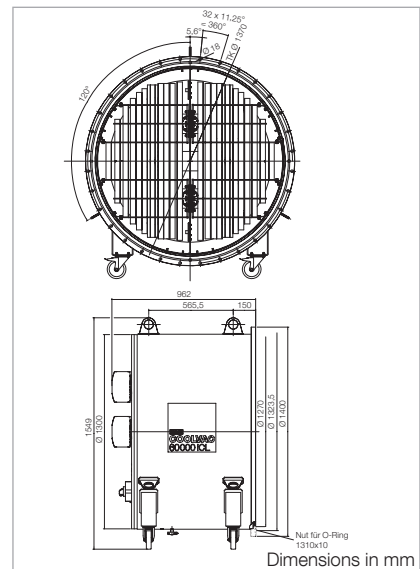
COOLVAC 60000 iCL with flange DN 1250 ISO-F

### Advantages to the User

- Hydrocarbon-free high vacuum
- High pumping speed for water vapor and nitrogen
- Fast, safe and efficient regeneration with the electric regeneration system <sup>1)</sup>
- Simple operation

### Typical Applications

- Space simulation chambers
- Evaporators
- Electron beam welding systems
- Optical coating systems
- Metallization systems



Dimensional drawing for the COOLVAC 60000 iCL

## Technical Data

## COOLVAC 18000 iCL COOLVAC 30000 iCL COOLVAC 60000 iCL

High vacuum flange	DN	630 ISO-F	35"ANSI	1250 ISO-F
Fore vacuum flange <sup>2)</sup>	DN	63 ISO-K	63 ISO-K	63 ISO-K
Flange with current feedthrough for silicon diode	DN	25 ISO-KF (2x)	16 ISO-KF (2x)	16 ISO-KF (2x)
Flange for other purposes	DN	40 ISO-KF	-	-
Flange with 11-way feedthrough with additional Pt 100 on flange	DN	-	40 ISO-KF	40 ISO-KF
Pressure-relief device with flange connection for gas exhaust line	DN	40 ISO-KF	40 ISO-KF	40 ISO-KF
<b>Pumping speed</b>				
H <sub>2</sub> O	l/s	46000	93000	180000
Ar / N <sub>2</sub>	l/s	13500 / 18000	25000 / 30000	47000 / 57000
H <sub>2</sub>	l/s	14000	30000	60000
<b>Capacity</b>				
Ar / N <sub>2</sub>	bar x l	6000	6500	9000
H <sub>2</sub> at 10 <sup>-6</sup> mbar	bar x l	65 <sup>3)</sup>	100 <sup>3)</sup>	150 <sup>3)</sup>
Built-in cold head	COOLPOWER	5/100 (2x)	5/100 (2x) and 140T (1x)	5/100 (2x) and 140T (2x)
<b>Max. throughput</b>				
Ar / N <sub>2</sub>	mbar x l/s (Torr x l/s)	14 (10.5)	14 (10.5)	25 (18.75)
H <sub>2</sub>	mbar x l/s (Torr x l/s)	7 (5.25) <sup>3)</sup>	7 (5.25) <sup>3)</sup>	12 (9) <sup>3)</sup>
Crossover value at 20 K	mbar x l (Torr x l)	800 (600)	1200 (900)	1000 (750)
Cool down time to 20 K	min	180	260	330
Overall height	mm	see drawing	see drawing	see drawing
Weight	kg (lbs)	131 (289)	262 (577.6)	503 (1109)
Silicon diode for temperature measurements at the second stage of the cold head		built-in (2x)	built-in (2x)	built-in (2x)
Regeneration heaters at the first stage of the cold head		built-in (2x)	built-in (3x)	built-in (4x)
second stage of the cold head		built-in (2x)	built-in (2x)	built-in (2x)

1) Accessories, necessary for automatic operations (i.e. electrical regeneration heaters, forevacuum valve DN 63 ISO-KF, and vacuum gauge DN 16 ISO-KF), are included with the scope of delivery and are connected to the integrated COOLDRIVE.

2) Electropneumatic angle valve included.

3) The maximum throughput values given for hydrogen (H<sub>2</sub>) are true for regenerated cryo pumps under short-term loads only. For continuous operations, both throughput and capacity values will be lower.

## Ordering information

**COOLVAC 18000 iCL**   **COOLVAC 30000 iCL**   **COOLVAC 60000 iCL**  
 High Voltage   Low Voltage   High Voltage   Low Voltage   High Voltage   Low Voltage

	Part No.	Part No.	Part No.
COOLVAC 18 000 iCL, DN 630 ISO-F	844631V0006	-	-
COOLVAC 30 000 iCL, 35" ANSI	-	844891V9005	-
COOLVAC 60 000 iCL, DN 1250 ISO-F	-	-	844896V9005

### Compressors, flexlines and cables

Compressor	840000V6001	-	840000V6001	-	840000V6001	-
CP 6000 H	(2x)	-	(3x)	-	(4x)	-
CP 6200 H	-	840000V6201	-	840000V6201	-	840000V6201
		(2x)		(3x)		(4x)
Power supply cable for compressor	see Ordering Information of the compressor units					
Set of flexlines						
FL 4.5 (1/2", 1/2")	892 87 (2x)		892 87 (3x)		892 87 (4x)	
or FL 9.0 (1/2", 1/2")	892 88 (2x)		892 88 (3x)		892 88 (4x)	
or FL 18.0 HP (1/2") + FL 18.0 LP (1/2")	840203 (2x) + 840204 (2x)		840203 (3x) + 840204 (3x)		840203 (4x) + 840204 (4x)	
Compressor unit control cable <sup>1)</sup>						
COOLPAK control cable, 5 m (16.4 ft)	844231V4005 (2x)		844231V4005 (3x)		844231V4005 (4x)	
or COOLPAK control cable, 10 m (32.81 ft)	844231V4010 (2x)		844231V4010 (3x)		844231V4010 (4x)	
or COOLPAK control cable, 20 m (65.62 ft)	844231V4020 (2x)		844231V4020 (3x)		844231V4020 (4x)	

### Optional electronics, cables and equipment

CRYOVISION control and display unit	844231V0002
CRYOVISION network / control cable	
CRYOVISION / Network control cable, 5 m (16.4 ft)	844231V2005
or CRYOVISION / Network control cable, 10 m (32.81 ft)	844231V2010
or CRYOVISION / Network control cable, 20 m (65.62 ft)	844231V2020

### Optional interface module

COOLVAC ProfiBus module ProfiBus – RS232 Converter for COOL.DRIVE and CRYOVISION	844000V1
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The arrangement of the components is shown in the chapter "Accessories" under the heading "COOLVAC iClassicLine, System Components".

1) The length of the control cable should match to the length of the flexlines.

# Cryo Pumps for Manual Operation, BasicLine

The COOLVAC cryo pumps of the BasicLine version are identical to the COOLVAC cryo pumps of the iClassicLine version concerning the technical data for pumping speed, capacity, cooldown time, built-in cold heads, maximum throughput, built-in temperature sensors for the second stage (Si diode) and the corresponding current feedthroughs.

The standard BasicLine models do **not** include the following components:

- Electrical regeneration heaters
- Temperature sensors for the first stages of the cold head(s)
- Vacuum gauge head
- Fore vacuum valve
- Temperature readout / display unit for the silicon diode(s)

We are glad to advise you of our assortment of accessories for our COOLVAC BasicLine range of cryo pumps.

All cryo pumps of the *iClassicLine* series (iCL) described above can be delivered as *Basicline* types, too. Please consult with our technical support.

E.g. for the following part numbers:

	Part No.
COOLVAC 10000 BL-V, DN 500 20" ANSI	844511V1004
COOLVAC 10000 BL-V, DN 500 ISO-K	844511V1006

# Cryo Pumps with Liquid Nitrogen Cooling of Radiation Shield and Baffle of Cryo Pump

## COOLVAC 30000 BL LN<sub>2</sub> and COOLVAC 60000 BL LN<sub>2</sub>



COOLVAC 30000 BL LN<sub>2</sub>



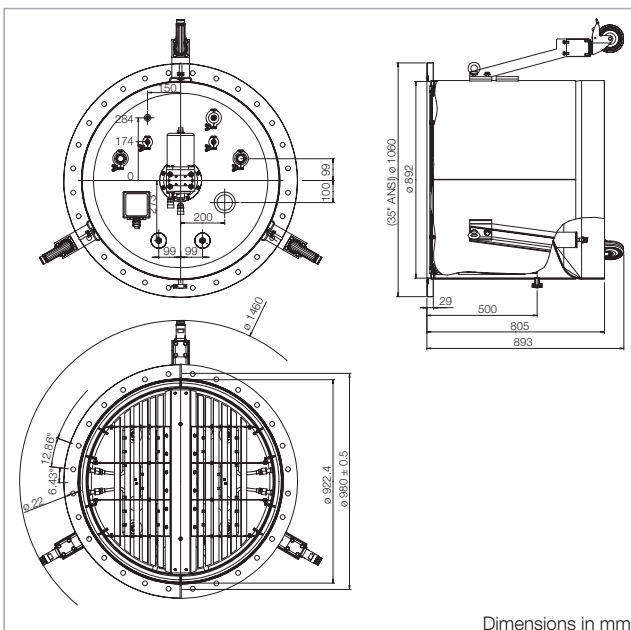
COOLVAC 60000 BL LN<sub>2</sub> with flange DN 1250 ISO-F

### Advantages to the User

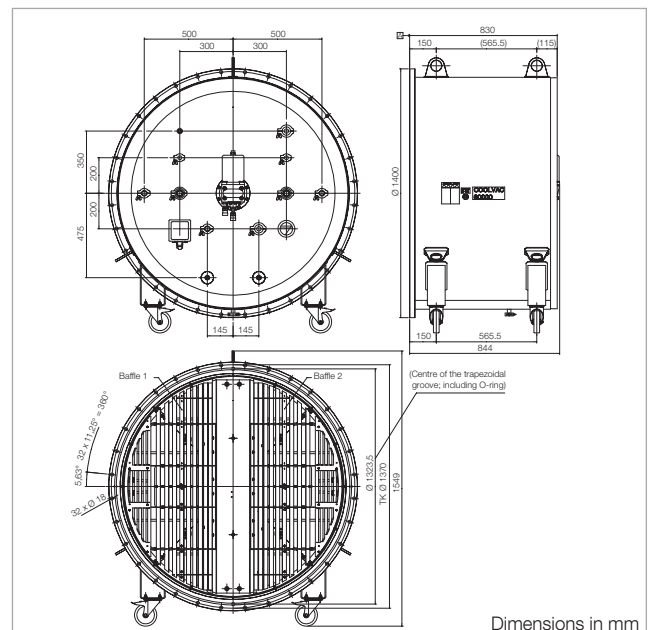
- Hydrocarbon-free high vacuum
- High pumping speed for water vapor and nitrogen
- Operating with only one compressor unit through liquid nitrogen (LN<sub>2</sub>) cooling of radiation shield and baffle
- Controlling of radiation shield and baffle temperatures by additional temperature sensor

### Typical Applications

- Space simulation chambers
- Vacuum furnaces



Dimensional drawing of COOLVAC 30000 BL LN<sub>2</sub>



Dimensional drawing of COOLVAC 60000 BL LN<sub>2</sub>

**Technical Data**
**COOLVAC 30000 BL LN<sub>2</sub>**
**COOLVAC 60000 BL LN<sub>2</sub>**

High vacuum flange	DN	35"ANSI	1250 ISO-F
Fore vacuum flange	DN	63 ISO-K	63 ISO-K
Flange with 4-pole current feedthrough for silicon diode*	DN	16 ISO-KF (2x)	16 ISO-KF (2x)
Flange with 6-pole current feedthrough for 3 Pt 100 (radiation shield and baffle halves)	DN	40 ISO-KF	40 ISO-KF
Pressure-relief device with flange connection for gas exhaust line	DN	40 ISO-KF	40 ISO-KF
Flange with abnormal temperature protection for the regeneration heaters of the built-in cold head	DN	40 ISO-KF	40 ISO-KF
Pumping speed			
H <sub>2</sub> O	l/s	93000	180000
Ar / N <sub>2</sub>	l/s	25000 / 30000	47000 / 57000
H <sub>2</sub>	l/s	30000	60000
Capacity			
Ar / N <sub>2</sub>	bar x l	6500	9000
H <sub>2</sub> at 10 <sup>-6</sup> mbar	bar x l	100 <sup>1)</sup>	150 <sup>1)</sup>
Built-in cold head	COOLPOWER	10 MD	10 MD)
Max. throughput			
Ar / N <sub>2</sub>	mbar x l/s (Torr x l/s)	> 15 (11.25) <sup>1)</sup>	> 30 (22.5) <sup>1)</sup>
Crossover value at 20 K	mbar x l (Torr x l)	2000 (1500)	3000 (2250)
LN <sub>2</sub> consumption, ca.	l/h	7	10
LN <sub>2</sub> connections		SS-8-VCR (1/2")	SS-8-VCR (1/2")
Cool down time to 20 K, approx.	h	5	6
Overall height	mm	see drawing	see drawing
Weight, approx.	kg (lbs)	300 (661)	400 (882)
Silicon diode for temperature measurements at the second stage of the cold head		built-in	built-in
Regeneration heaters at the			
first stage of the cold head		built-in	built-in
second stage of the cold head		built-in	built-in

\* temperature sensor at the second stage of the cold head.

<sup>1)</sup> The maximum throughput values given for hydrogen (H<sub>2</sub>) are true for regenerated cryo pumps under short-term loads only. For continuous operations, both throughput and capacity values will be lower.

## Ordering information

**COOLVAC 30000 BL LN<sub>2</sub>**  
High Voltage      Low Voltage

**COOLVAC 60000 BL LN<sub>2</sub>**  
High Voltage      Low Voltage

	Part No.	Part No.
COOLVAC 30 000 BL LN <sub>2</sub> , 35" ANSI	844890V9501	-
COOLVAC 60 000 BL LN <sub>2</sub> , DN 1250 ISO-F	-	844895V9503

### Compressors, flexlines and cables

Compressor	840000V6002	-	840000V6002	-
CP 6000 HMD, 400 V / 50 Hz / 460 V / 60 Hz / 3-ph.	840000V6002	-	840000V6002	-
CP 6200 HMD, 200 V / 50 Hz / 200 – 230 V / 60 Hz / 3-ph.	-	840000V6202	-	840000V6202
Power supply cable for compressor	see Ordering Information of the compressor units			
Flexible pressure line (for operating mechanically driven cold heads)				
9 m (29.53 ft), FL9 HP – DN20 (8f/8f) + FL9 LP – DN32 (8f/8f)	840217 + 840218V0032			
20 m (65.62 ft), FL20 HP – DN20 (8f/8f) + FL20 LP – DN32 (8f/8f)	840230V2020 + 840231V2032			
Cable cold head motor compressor unit <sup>1)</sup>				
9 m (29.53 ft)	842 110			
20 m (65.62 ft)	842 112			

### Optional equipment and cables

Low temperature measuring instrument MODEL 211S	844 110
HV cable, 4-way, with plug to the MODEL 211S	
10 m (32.81 ft)	844 113
20 m (65.62 ft)	844113V20

### Additional accessories (selection)

Forevacuum valves <sup>2)</sup>	
Right-Angle DN 63 ISO-K, electropneumatically operated, with pilot valve 24 V DC, Aluminum body	10800V01
Right-Angle DN 63 ISO-K, electropneumatically operated, with pilot valve 24 V DC, stainless steel body	10810V01
Pressure sensor	
THERMOVAC Transmitter TTR 91 N, DN 16 ISO-KF (without switching threshold)	230035V02
THERMOVAC Transmitter TTR 91 N, DN 16 ISO-KF, (with switching threshold, 2SP)	230040V02
Connection cable to TTR 91 N, FCC 68 on both ends, 8-way shielded <sup>3)</sup>	Type A
10 m (32.81 ft)	230 012
20 m (65.62 ft)	124 28
30 m (98.43 ft)	124 29

1) The length of the control cable should match to the length of the flexlines.

2) See catalog "Valves" for additional right-angle valves.

3) The length of the control cable should match to the length of the flexlines.