

ENGINEERING
TOMORROW

Danfoss

Product Selection and Programs Guide

Vickers® by Danfoss Industrial Cylinders

Customized solutions for the future



VICKERS
by Danfoss

Customizing solutions for the future

Danfoss' global cylinder footprint provides its channel with local engineering, project management, service, and repair support.

Available in standard or custom-engineered models, Vickers by Danfoss industrial cylinders offer quality, variety, and features to meet the needs of the most demanding applications around the world. Danfoss' cylinders are found in the harshest environments including offshore drilling rigs, steel mills, bridges, and hydropower gates.

Decades of application expertise and cylinder experience translates to better solutions for all types of infrastructure applications. Danfoss' cylinders can be found worldwide, used in prestigious locations such as the Panama Canal, the Thao Long Dam, and the Emsworth Dam.

This experience coupled with the comprehensive product offering results in Danfoss' reputation as a trusted leader for reliable, consistent, and high-performance cylinders.

Contents

Hydraulic Cylinders	2
Cylinder Programs	3
Cylinder Configurations	3
Laser Clad Weld Overlay	4
Application Data Sheet	5
Series Specifications	6
Literature/Catalogs	7
Markets and Applications	8

Hydraulic cylinders

Vickers by Danfoss industrial cylinders are manufactured to order and offer a wide range of bore, rod, and mounting combinations. The size and style of a hydraulic cylinder will vary depending on the application and load requirements.



Tie-Rod

Industrial tie-rod cylinders are held together by the use of tie-rods and nuts. Considered one of the most common types of construction, it meets NFPA and ISO industry standards.



Light Duty Pneumatic

Broad range of repairable, light weight, low-cost, air cylinders.



Threaded

Head and cap thread onto the body tube, providing a clean, compact profile ideal for wash-down environments or applications with space limitations.



Welded

Eliminate system leaks in high side load applications with the innovative sealing design. Built with high-yield strength steel to keep systems operating smoother.



Mill Duty

Engineered to survive in the extremely demanding environments of primary metal, and other HD type applications.



Electrohydraulic

Combine a high-performance cylinder, precision feedback transducer and control valve mount in a single package.



Extra Large Custom

Custom engineered to order cylinder solutions for some of the world's toughest applications.

Danfoss cylinder programs

Danfoss express ready cylinders

- **NZ NFPA**
High Pressure, Hydraulic Tie-Rod
- **RE NFPA**
Low Pressure Hydraulic/Pneumatic Tie-Rod
- **VP**
Single Rod Aluminum, Pneumatic Tie-Rod
- **TA**
Threaded Series
1.50 – 6.00" Bore, Stroke to 60",
Many mounts, cushions, and more

Danfoss express program requirements

- Clearly mark orders with "Cylinder Express" and email to Express@Danfoss.com
- Orders must be drop shipped to the end-customer's location (exceptions will be made for shipments to Canada and Mexico only)
- Valid customer ship-to information and routing instructions are required at time of order
- Standard distributor CCR discounts apply
- Express orders received by 12:00 pm CST will ship by the end of the 3rd day after order receipt
- Maximum order quantity of 5 per model code, per ship-to address



For more information:
www.danfoss.com

Selection and use

- Typically, industrial cylinders can be found in manufacturing, metals processing, oil and gas, and renewable energy. Cylinders are used for stabilizing oil rigs in ocean water, rotating the turbine blades on a wind turbine, and regulating water flow of a hydro-electric dam.
- When choosing cylinders, there are a few key selection criteria to keep in mind: operating pressure, force requirements, bore size and rod diameter, stroke, mounting, environmental conditions, speed, operating fluid, and port and rod end connections.

The online Cylinder Pricing and CAD Configurator

The Online Cylinder Pricing and CAD Configurator is a configuration tool designed to help equipment manufacturers and distributors create model codes, list prices, and CAD drawings for our cylinder products. You can download the exact product model needed from more than 150 CAD and graphic formats, including native formats in Autodesk® Inventor™, SolidWorks®, CATIA® and many more. These on-demand capabilities eliminate the wait for CAD drawings and cylinder quotations.

This user-friendly tool delivers quick access to CAD drawings and list prices to meet distributor needs whether behind the desk or on the go. Our mobile device compatibility feature lets you configure a cylinder while sitting in a meeting with a customer. It provides online immediate access to:

- List Pricing (Distributor feature only)
- Typical Lead-times
- 2D and 3D Drawings
- PDF Datasheets
- Application Guides
- Calculation Tools
- IOS and Android Mobile Device Compatibility

The Online Cylinder Pricing and CAD Configurator



Vickers by Danfoss industrial cylinders

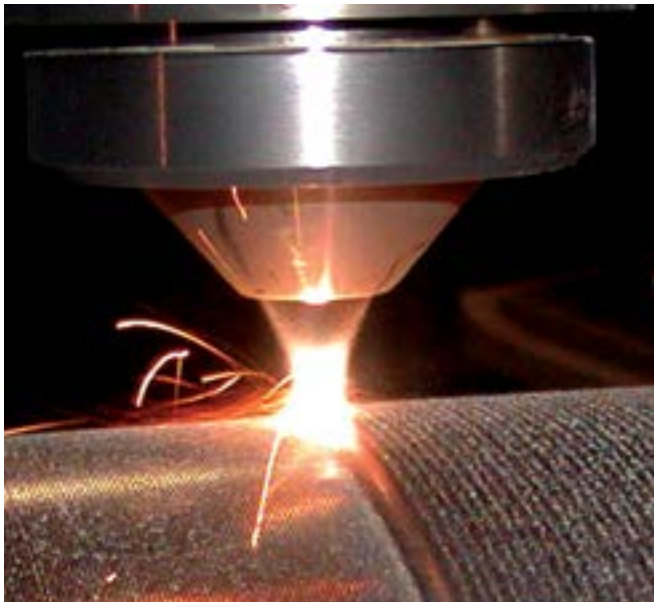
Hydroclad® laser clad weld overlay

Laser cladding provides uptime and reliability to enhance operating efficiency. Anti-corrosion protection is an important requirement for high-functioning cylinders, and our award-winning anti-corrosion laser cladding is best in class.

Hydroclad laser clad weld overlay is a high-performance, field repairable, third-party certified, cylinder rod coating for the most demanding saltwater applications and harshest operating environments.

A primary benefit of laser cladding is field repairability. Over time, rods may be damaged due to:

- Harsh environments
- Improper material handling practices
- Hard debris falling from the upper derrick or floating in the water
- Swinging chains



Benefits of laser clad weld overlay

- Corrosion-resistance: field tests have shown Danfoss' cylinders have been in use on offshore oil rigs for more than 5 years (43,800+ hours) without performance degradation in a saltwater environment
- Flexibility without cracking: can be applied to cylinder rods up to 21 meters long and can withstand up to 180-degree bend without cracking
- Impact resistance and wear: withstands impact up to 24 foot pounds of force without cracking
- Field repairable: repair damaged coatings on-site

Application Base Coatings: ABC

Laser cladded coatings	ABC-L1	ABC-L1 laser cladding is a high performance, field repairable, DNV certified, cylinder rod coating for the most demanding applications and harshest operating environments, that provides uptime and reliability to enhance offshore rig / ship operating efficiency. Premier fresh and saltwater corrosion resistance designed for saltwater splash zone.
	ABC-L2	Laser cladding cylinder rod coating with excellent corrosion and ductility for non-splash zone applications.
Ceramic and HVOF coatings	ABC-H	Metallic HVOF sprayed coating for highly corrosive and abrasive environments.
	ABC-P3	Metal oxide plasma sprayed coating for abrasion and corrosion resistance in fresh and brackish water environments and for Hypos applications.
Galvanic coatings	ABC-G2	Galvanic nickel chromium plating with standard wear resistance and increased corrosion resistance.
	ABC-G1	Galvanic hard chromium plating with standard wear resistance and corrosion resistance.

Let us help select the right coating for your application.

Features

- Third party certified
- Suitable for offshore deep water exploration and production, marine, and other heavy duty applications
- Applicable to new or refurbished hydraulic cylinders
- Optimized corrosion, wear, scratch, and impact resistance
- Tight process control designed for consistent results
- Optimized for ductility and toughness

Vickers by Danfoss industrial cylinders

Cylinder Application Data Sheet

Submit an application data sheet today to have Danfoss' cylinder engineers recommend the right cylinder for your application

Cylinder Application Data Sheet

Customer Name:					
Contact:					
Phone:		Fax:		E-mail:	
Project Name/RFQ #				RFQ Due Date	
Application				Market	

Cylinder Specifications

Quantity		Customer Drawing #		Rev #	
Series/Construction	Mounting Style	Bore	Rod Diameter	Stroke	
Cushions	Rod end style	Port Size/Type	Port Position	Seals	
Non Cushioned					
Cylinder Orientation			Degrees from Vertical	°	
Rod End Connection			Known Side Load		
Weight connected to rod					
Special Rod Material					
Transducer Requirements					
3rd Party Certification	None				

Cylinder Operating Environment

Environment		Other (define)	
Operation Fluid		Temperature	°C
Operating Pressure Extend		Operating Pressure Retract	
Extend Force		Retract Force	
Extend Velocity		Retract Velocity	
Cycle Rate		Cycle Life of Cylinder	Cycle Life Seals

Other Requirements

Material Certs Required:	None
Special Paint Requirements:	
Other Special Requirements:	None

Additional Information/Special Requirements:

Prepared By		Date	
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Vickers by Danfoss industrial cylinders

Series Specifications

Industrial Tie-Rod

Series	Description	Comment
Series NZ	3000 PSI, NFPA 1-8" Bore Vickers	Lead cylinder product to drive sales growth Easy interchangeability - Full range of NFPA interchangeable mounts to allow for drop in replacement Designed for easy low cost serviceability - Special tools not required - Unitized rod cartridge design for easy seal installation
Series VG	3000 PSI, 10-30" Bore Vickers	Designed for long life - High strength steel heads, caps and tubing - Rolled tie-rod threads Direct replacement for: Parker (Miller, Atlas, Shrader, Lin-Act), Rexroth, Sheffer, Yates
Series TV	210 bar ISO 6020-2 DIN 24552 25-200mm Bore Vickers	Easy Interchangeability Full range of ISO 6020-2 interchangeable mounts to allow for drop in replacement Competitors to replace: Parker (Miller, Atlas, Shrader, Lin-Act), Rexroth, Sheffer
Series RE/RF	250 PSI Air, 1000 PSI Hydraulic NFPA , 1½ -14" Bore Vickers	Heavy duty steel pneumatic NFPA cylinder Improves application coverage, and lead-time Direct replacement for: Parker (Miller, Atlas, Shrader, Lin-Act), Rexroth, Sheffer

Light Duty Pneumatics

Series	Description	Comment
Series L		
VP	NFPA Aluminum, 3/4-8" Bore 250 PSI	Repairable, low cost aluminum tie-rod cylinder. 22 NFPA interchangeable mounts
RL	Rodless 16-80mm Bore 15-150 PSI	Compact, smooth and precise performance at high velocity; extruded aluminum
BL	Non-Rotating, 1.125-4" Bore 150-250 PSI	Aluminum twin rod design for non-rotating, anti-torque applications; interchangeable with NFPA cylinders
ML	ISO 6431/VDMA 24562, 32-320 mm Bore	Modular design with wide range of bolt-on mountings
SL	Stainless steel, 1.125 - 8" Bore 250 PSI	NFPA interchangeable mounts; 303/304 Stainless steel construction with aluminum alloy piston Competitors to replace: Festo, Parker, SMC

Welded Series

Series	Description	Comment
Series W		
WH	3000 PSI 4 - 12" Bore Vickers	Compact design fits into tight spaces Designed for serviceability - Fully serviceable for lower downtime Designed for long life - High strength caps and tubing - Precision machined ductile iron gland provides a long bearing surface for side-loading resistance and prevention of premature seal failure - Mechanically energized seals ensures smooth operation for longer life Competitors to replace: Hanna, Hunger (Parker/Atlas, Clover, CRC)

Vickers by Danfoss industrial cylinders

Series Specifications

Mill Duty Series

Series	Description	Comment
Series M		
EM	250/2000/3000 PSI Imperial 2–16" Bore Danfoss	Heavy duty Mill Duty construction Designed for easy low cost serviceability - Fully serviceable for lower downtime Designed for long life - An integral bearing and seal design featuring heavy duty wearbands resists side loads. The wide separation of these wearbands reduce bearing stresses and maximize cylinder service
IM	25 MPA ISO 6022 Metric 40–320 mm Bore Danfoss	- Greater bending stress capacity for increased durability - Threaded body flanges provides 22% better yield strength vs. welded material for higher shear safety factors - High strength wearbands eliminate metal to metal contact providing increased load carrying capability Direct replacement for: Rexroth, Hanna, Anker Holth, Hunger, Hydranamics

Threaded Series

Series	Description	Comment
Series TA/TB	3/4-8" Bore 250 PSI air; 1000 PSI hydraulic Vickers	Compact profile eliminates wasted space Clean design, no tie-rods to collect dirt and debris Ideal for wash-down environments (e.g. Food processing equipment) Fully adjustable cushions Designed for long life - Nitride cast iron rod cartridge - High strength steel heads, caps and tubing - Hardened piston rod - Long heads threaded onto the body provide greater side load distribution and improved rod guidance

XL Series

Series	Description	Comment
XL	300–1000 mm Bore	No industry standard Engineered to order Varying construction methods 3rd party certifications, as required Direct replacement for: Rexroth, Douce

Electrohydraulic Series

Series	Description	Comment
EH	1.5" - 8" (38.1 mm – 203.2 mm) 300 – 1000 mm Bore	Time savings - no need to integrate separate components Cost savings - single-source solution reduces costs Design flexibility - wide range of styles, mountings, sizes and valves Eliminates leaks and piping problems Helps eliminate waste and increase production

Vickers by Danfoss industrial cylinders

Market Application

		Tie-Rod					Mill Type		Welded	Threaded	XL
		Heavy Duty				Medium Duty	Imperial	Metric			Custom
Market	Application	NZ	EH	VG	TV	RE/RF	EM	IM	WH	TA/TB	
Plastic Machinery	Blow Molds	X	X	X	X						
	Injection Molding	X	X	X	X	X				X	
	Jack Rams						X	X			X
	Structural Foam	X		X	X					X	
Machine Tool	Transfer Lines	X		X	X	X				X	
	Clamping	X	X		X	X					
	Feed	X	X		X	X					
Discrete Manufacturing	Metal Forming and Cutting	X	X	X	X		X	X			
	Press Brakes	X	X	X	X		X	X			
	Extrusion Presses	X	X	X	X		X	X			X
	Forging Presses	X	X	X	X		X	X			
Processing	Furnace Cylinders	X			X		X	X			X
	Rolling Mill	X	X		X		X	X			
	Pulp and Paper Mills	X	X		X					X	
	Food Processing Equipment	X	X		X					X	
Mining and Bulk Material Handling	Stacker Reclaimers						X	X	X		X
	Rope Shovels										X
	Tipplers and Crushers						X	X			X
	High Wall Mining Systems						X	X	X		
	Tunnel Boring						X	X	X		X
Oil and Gas	Motion Compensation						X	X			X
	Cantilever Skidding Systems						X	X			X
	Pipe Laying Equipment						X	X		X	
	Mooring Systems						X	X			
	BOP Handling										X
	Chain Jack Systems						X	X	X	X	
Alternative Energy	Turbine Governor Control	X	X	X	X		X	X			X
	Wind Turbine Pitch Control	X	X		X		X	X	X		
	Nuclear Power	X	X		X	X					
Marine	Ship Steering Systems and A-frames	X	X	X			X	X	X		
	Naval Vessels	X	X	X			X	X	X		
	Subsea Systems						X	X		X	
	Split and Piling Barge						X	X		X	X
	Dredging and Dump Scowl						X	X		X	X
Civil	Moveable Bridges		X				X	X			X
	Flood Control Gates	X		X	X		X	X			X
	Locks and Canal Gates						X	X			X
	Dam Gates	X	X	X	X		X	X			X
	Rising Stem Valve Cylinders		X				X	X			X
Scrap and Waste Management	Cardboard Balers						X	X	X	X	
	Rubber Balers						X	X	X	X	
	Stationary Compactors						X	X	X	X	
Entertainment	Motion Bases	X	X	X	X	X				X	X
	Wave Making Machines	X	X	X	X	X				X	X
	Simulators	X	X	X	X	X				X	
	Animation	X	X		X	X				X	

Vickers by Danfoss industrial cylinders

Market Application

DISCRETE MANUFACTURING

Markets

- Metal Forming
- Injection Molding
- Blow Mold Machines
- Forging and Extrusion Press
- Press Brake
- Die Casting
- Clamping
- Transfer Lines

Cylinders

- Tie-Rod: NZ, VG, TV, RE/RF, EH
- Mill Type: EM, IM
- Threaded: TA/TB
- XL Custom



DISCRETE MANUFACTURING

VG NZ EH



Injection Molds:
21 standard NFPA interchangeable mounts. Unitized rod bearing provides maximum bearing support and wear resistance. Fully adjustable cushion allows maximum acceleration, faster cycle times, and increased machine production.

RE/RF



Metal Forming:
Bore sizes range from 1.50" to 14". 17 NFPA interchangeable mounts available. Unitized rod bearing allows for easy rod seal maintenance.

EM IM



Extrusion Press:
Integral bearing design with wearbands provides improved side load capability. Threaded body flange offers higher safety factors over welded flange designs.

TA/TB



Clamping:
Compact design to address space constraints. Able to withstand high side loads. Bore sizes range from 3/4" to 8".

PROCESSING

Markets

- Tilt and Electric Arc Furnace
- Grinding Mills
- Steel Processing
- Foundries
- Food Processing
- Pulp and Paper Mills
- Balers and Compactors

Cylinders

- Tie-Rod: NZ and TV
- Mill Type: EM, IM
- Threaded TA/TB
- XL Custom



PROCESSING

NZ TV VG EH



Pulp and Paper Mills:
Imperial and metric heavy duty tie-rod cylinders. Electro-hydraulic options allow for precise position measurement.

EM IM



Rolling Mill:
Imperial and metric designs available. Threaded body flange provide improved performance and increased safety factor.

TA/TB



Food Processing:
Clean compact design is ideal for wash-down environments. Able to withstand high side loads. Bore sizes range from 3/4" to 8".

XL Custom



Furnace, Steel Processing, Foundries:
Bore sizes range from 300 to 1000 mm. Engineered to order. Alternative coatings offer enhanced wear and abrasion.

Vickers by Danfoss industrial cylinders

Market Application

MATERIAL HANDLING / MINING

Markets

Stacker Reclaimers
Rope Shovels
Tippers and Crushers
High Wall Mining Systems
Tunnel Boring

Cylinders

Mill Type: EM, IM
Welded: WH
XL Custom



ALTERNATIVE ENERGY / WAVE

Equipment Types

Turbine Governor Control
Wind Turbines
Nuclear Power
Wave Power

Cylinders

Tie-Rod: NZ, EH, VG, TV and RE/RF
Mill Type: EM, IM
Threaded: TA/TB
XL Custom



MINING / MATERIAL HANDLING

EM IM



Stacker Reclaimer:
Integral bearing design with wearbands provides improved side load capability. Threaded body flange offers higher safety factors over welded flange designs.

WH



High Wall Mining System:
Industrial grade cylinder with gland and sealing system designed for side load protection. Bore sizes range from 4" to 12".

XL Custom



Rope Shovels:
Engineered-to-order hydraulic cylinders. Alternative coatings offer enhanced wear and abrasion.

ALTERNATIVE ENERGY / WAVE

EM IM



Wave Power:
Threaded body flange offers higher safety factors over welded flange designs. Laser Cladding extends the rod coating life and increases operational predictability.

RE/RF



Nuclear Power:
Bore sizes range from 1.50" to 14". 17 NFPA interchangeable mounts available. Unitized rod bearing allows for easy rod seal maintenance.

WH EH



Wind Turbine:
Industrial grade cylinder with gland and sealing system designed for side load protection. Bore sizes range from 4" to 12".

XL Custom



Turbine Governor Control:
Bore sizes range from 300 to 1000 mm. Engineered-to-order with electro-hydraulic options for precise position measurement.

Vickers by Danfoss industrial cylinders

Market Application

OIL AND GAS

Markets

Motion Compensation
Cantilever Skidding Systems
Pipe Laying Equipment
Mooring Systems
BOP Handling
Chain Jack Systems
Cranes

Cylinders

Mill Type: EM, IM
Welded: WH
Threaded: TA/TB
XL Custom



MARINE

Markets

Ship Steering Systems
and A-frames
Naval Vessels
Subsea Systems
Split and Piling barge
Dredging and Dump Scow
Salvage Equipment

Cylinders

Tie-Rod: NZ, VG
Mill Type: EM, IM
Welded: WH
Threaded: TA/TB
XL Custom



OIL AND GAS

EM IM



Mooring:
Imperial and Metric designs available.
Electro-hydraulic options allow for
precise position measurement. ABS
and DNV certification available.

WH



Chain Jack Systems:
Industrial grade cylinder with gland and
sealing system designed for side load
protection. Bore sizes range from 4" to 12".
ABS and DNV certification available.

TA/TB



Pipe Laying Equipment, Clamping:
Compact design to address space
constraints. Able to withstand high side
loads. Bore sizes range from 3/4" to 8".

XL Custom



Motion Compensation:
3rd party certified engineered cylinders
with Laser Cladding extends life and
increases operational predictability.
ABS and DNV certification available.

MARINE

NZ VG



Ship Steering:
21 standard NFPA interchangeable mounts.
Unitized rod bearing provides maximum
bearing support and wear resistance.
ABS and DNV certification available.

EM IM



Subsea Vessels:
Imperial and Metric designs available.
Laser Cladding extends life of the piston
rods. ABS and DNV certification available.

WH



A-Frames:
Industrial grade cylinder with gland and
sealing system designed for side load
protection. Bore sizes range from 4" to 12".
ABS and DNV certification available.

XL Custom



Split and Piling Barge and Dredging:
Bore sizes range from 300 to 1000 mm.
Engineered to order. Alternative coatings
offer enhanced wear and abrasion.

Vickers by Danfoss industrial cylinders

Market Application

CIVIL

Markets

Moveable Bridges
Flood Control Gates
Locks and Canal Gates
Dam Gates
Rising Stem Valve Cylinders
Waste Water Treatment

Cylinders

Mill Type: EM, IM
Welded: WH
Threaded: TA/TB
XL Custom



CIVIL

EM IM



Flood Control Gate:
Threaded body flange provides improved performance and increased safety factor. Electro-hydraulic options allow for precise position measurement.

WH



Rising Stem Cylinders:
Gland and sealing system designed for side load protection. Bore sizes range from 4" to 12". Alternative rod coatings available to extend cylinder life.

XL Custom



Lock and Canal, Dam Gates:
Engineered-to-order cylinders. Laser Cladding extends cylinder life and increases operational predictability. Variety of position measurement systems available.

SCRAP AND WASTE MANAGEMENT

Markets

Cardboard balers
Rubber balers
Stationary Compactors

Cylinders

Mill Type: EM, IM
Welded: WH
Threaded: TA/TB



SCRAP AND WASTE MANAGEMENT

EM IM



Cardboard and Rubber Baler:
Threaded body flange provides improved performance and increased safety factor. Electro-hydraulic options allow for precise position measurement.

WH



Stationary Compactor:
Gland and sealing system designed for side load protection. Bore sizes range from 4" to 12".

TA/TB



Cardboard and Rubber Baler:
Compact profile eliminates wasted space. Able to withstand high side loads. Bore sizes range from 3/4" to 8".



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