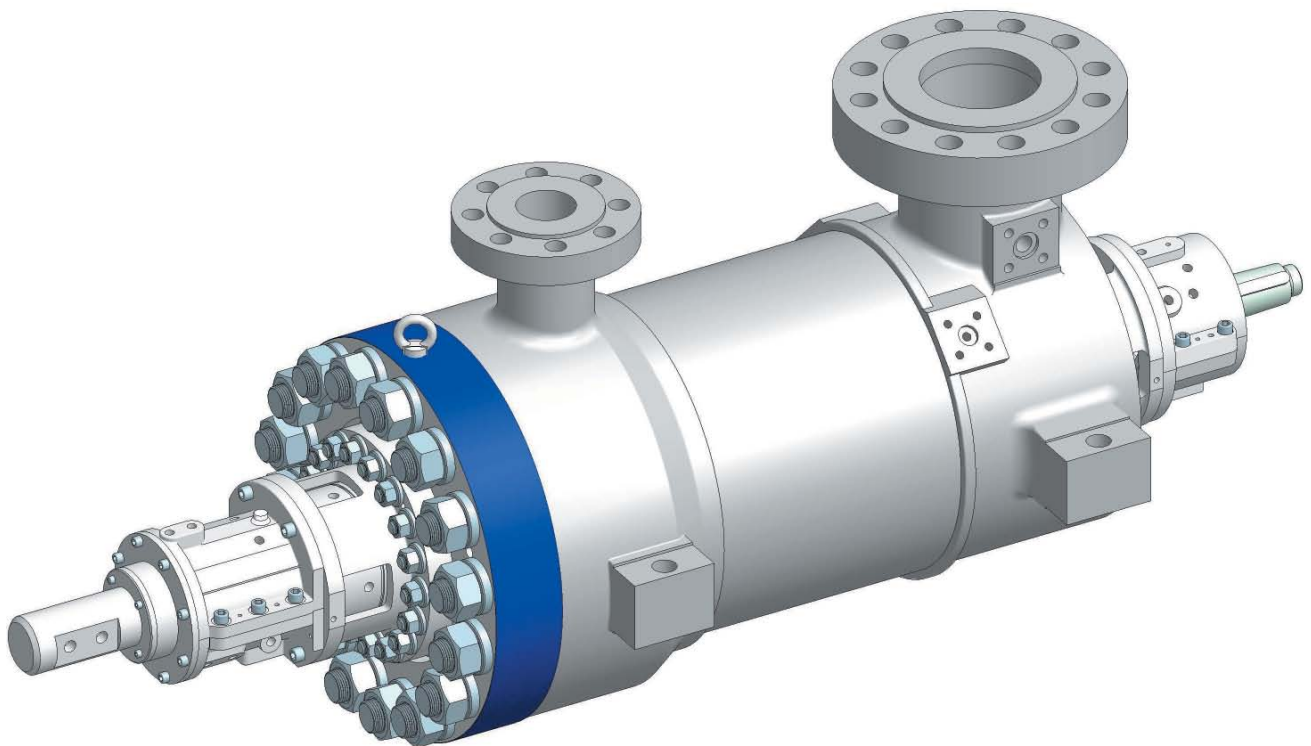


### GSG Diffuser Style Barrel Pump ISO 13709 (API 610) Type BB5



The Heart of Your Process

**motralec**

4 rue Lavoisier . ZA Lavoisier . 95223 HERBLAY CEDEX

Tel. : 01.39.97.65.10 / Fax. : 01.39.97.68.48

Demande de prix / e-mail : [service-commercial@motralec.com](mailto:service-commercial@motralec.com)

[www.motralec.com](http://www.motralec.com)

# Sulzer Pumps

Sulzer Pumps is a world leader in reliable products and innovative pumping solutions. Our advanced research and development, detailed process and application knowledge together with a comprehensive understanding of market demands keeps us consistently at the leading edge of technical development. Our global network of modern manufacturing and packaging facilities together with sales representatives located close to major markets provide fast responses to customer needs.

Sulzer Pumps has a long history of providing innovative pumping solutions to business partners in the following industries:

- q .HK @MC & @R
- q 'XCQNB@QANM /QNB
- q /TKO @MC /@ODQ
- q /NVDQ &DMDQ@SHNM
- q &DMDQ@K (MCTRSQX
- q "GDLHB@K /QNBDRR (MCTRSQX
- q 6@SDQ @MC 6@RSDV@SDQ

## GSG Global Manufacturing Facilities



Jundiaí, Brazil



Dalian, China



%UXFKVDO \*HUPDQ\



Navi Mumbai, India

\$SSOLF DWLRQ .QRZOHGJH IRU %HWWHU

'XCQNB@QANM DWSQ@BSHNM@K@MOR in  
 QDjMDQHDR ODSQNB GidwHBr@K@K@M@S@R@M@C  
 gas plants operate sophisticated production processes requiring  
 QDKH@AKD OTLOHMF RSHNTSHNSM@NT@MRHSD  
 tinuous product innovations such as our improved hydraulic perfor-  
 mances on oil production, power generation and process pumps are  
 helping the industries to improve its  
 NODQ@SHNM@K DEjBH

- q 1DjMHMF
- q &@R /QNBDRRHMf
- q Petrochemicals
- q -HSQNFDMNTR %DQSF



# Extensive Product Range

3 GD & 2 & HR ATHKS SN 3SGDT K @ SDR SN E CNT Q & SHNM NE (2. / ( installed in the world in: a type BB5, horizontal, radially split, diffuser type, multistage barrel pump. The rotor stack can be DHSGDQ HMKHMD @ K Kq S @ R HQ D B K R B R M FE @ B SNV @ QCR SGD CQHUDQ . MFGA @ B J @ SMC NEER C injection services q . MRGNQD @ MC NEER C ping service q . MRGNQD BQTC D NHK TBS @ MC + / & OHODKHMD RDQ S T B R

installed in the world in:  
 q / NVDQ / K @ MSR  
 q 1 Dj MDQHDR  
 q / DSQNBGDLHB @ K / K @  
 S @ R HQ D B K R B R M FE @ B  
 SNV @ QCR SGD CQHUDQ . MFGA @ B J @ SMC NEER C  
 injection services  
 q . MRGNQD @ MC NEER C  
 ping service  
 q . MRGNQD BQTC D NHK  
 TBS @ MC + / & OHODKHMD RDQ S T B R



## (QJLQH HUH G IRU \$SSOLF DWLRQ ) OH[LEL

The barrel is available as either a casting or forging with a variety of k @ MFD Q @ SHMFR SN L S @ R H M CHUHCT @ K RODBH j B @ SHNMR (S HR MNQL @ K KX B DMS D Q line supported for thermal stability @ MC L @ WHLTL MNY Y K D T H C R C V B @ G @ M X R S @ F A D R with @ A @ S y s t e m s . For ity. The barrel closure is either the SQ @ CHSHNM @ K k @ M F D C M T S R k @ M F D C G D @ C Sulzer's patented Twistlock closure for speedy removal and assembly.

different diffuser/impeller combinations, or blank stages — all in the L S @ R H M CHUHCT @ K HR MNQL @ K KX B DMS D Q For applications on light gravity back rotor stack is utilized to allow die cast or forged rotor stack and provide improved rotor dynam- HBR (M RTBG QNSNQ Rare S @ B L N O O N R D C HLODKKDQR B @ MBDK LNRS NE SGD @ WH @ K thrust. The center bushing and throttle bushings take most of the QDRHCT @ K @ WH @ K S

bearing loads are minimal. The back-to-back design allows the use NE @ RDQHDR A @ KK SG — and saves the substantial cost and maintenance components as- For high pressure and high energy levels, inline, or back-to-back stack, high speed, semi-stiff rotor designs Rare S @ B L N O O N R D C

### Materials

KK BNLLNM (2. / ( Materials Some limitations can be used

The inner cartridge consists of stacked diffuser/impeller sets. A CNTAKD RTBSHNM jQRS RS @ FD HLODKKDQ is available on all but the small- DRS RHYDR WH @ K S C sated by a balance drum for inline stacked rotors. The diffusers hydraulically balance radial forces. For those services where intermediate pressure takeoff is needed, higher kNV CHEETRDQ HLODK utilized up to the takeoff stage, @ MC SGDM KNVDQ kNV after the takeoff stage to optimize DE j BHDMBX @ MC ODQE 6GDM CDRHFM BNMCHS erates are similarly achieved using



\*6\* SDFNDJH UH DG \ IRU VKLSPHQW DW 6XO]

\* 6 \* , Q O L Q H ' H V L J Q ) H D W X U H V D Q G % H Q F

**Casing Cover**

- q Flanged head, studs/nuts
- q % K @ M F D C G D @ C 2 T O D Q M T S
- q O-ring or spiral wound gasket

**Axial Thrust Balance**

- q Balance drum
- q Swirl break technology

**Mechanical Seals**

- q ( 2 . / ( R D @ K R
- q Single, dual, dual pressurized
- q - N M B N M S @ B S F @ R R D B N M C @ Q X

**Thrust Bearing**

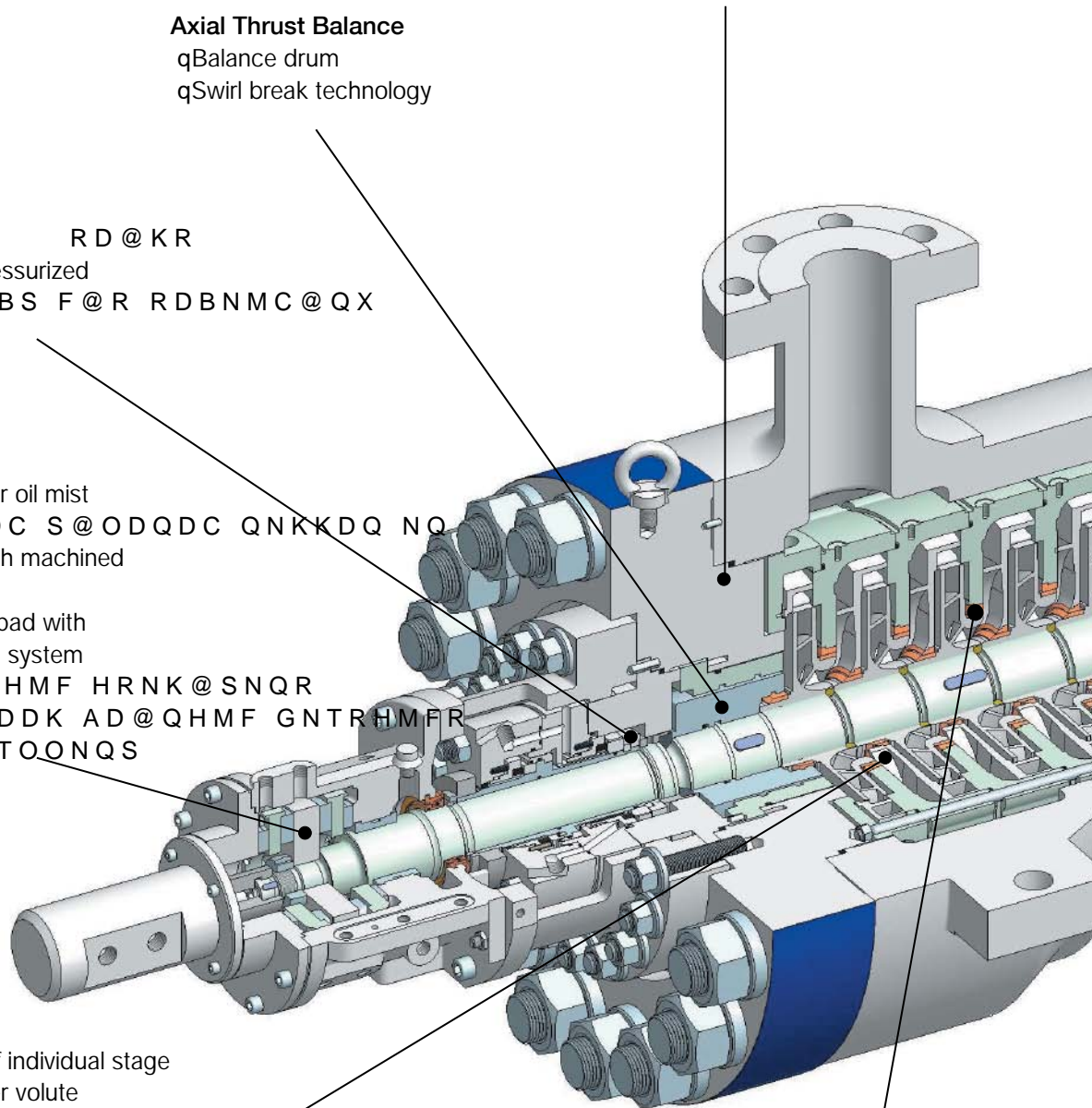
- q Fan cooled ring oil, or oil mist
- q K T A Q H B @ S D C S @ O D Q D C Q N K K D Q N Q
- q series double ball with machined brass cages, or
- q Double acting tilting pad with force feed lubrication system
- q ( - / 1 . ¥ A D @ Q H M F H R N K @ S N Q R
- q " @ Q A N M R S D D K A D @ Q H M F G N T R H M F R
- q V H S G ; R T O O N Q S

**Diffusers/Impellers**

- q Allow replacement of individual stage pieces vs. entire inner volute
- q O-ring or metal-to-metal stage casing
- q j S R
- q Key driven enclosed impellers
- q % N Q ' / ( @ O O K H B @ S H N M R R G Q H M J j S @ W H @ K K X
- q secured impellers, and stepped shaft at each stage
- q Blank stages can be supplied for future conditions

**Wear Parts**

- q Variety of materials, hardness, and hard coatings available depending on pump material and application
- q PEEK with reduced clearances
- q @ U @ H K @ A K D N M B K D @ M k T H
- q D M G @ M B D C D E j B H D M B X



**Interstage Takeoff**

- q / @ QSH @ K kNV S @ JDNEE EQNL HMSDQLDCH @ SD RS @ FD
- q Able to stack high capacity and low capacity diffusers/impellers on same rotor for optimized stage takeoff
- q " NLLNM NM ANHKDQ EDDC OTLOR
- q Available on recycle process applications
- q Saves cost of additional pump

**First Stage Impeller**

- q + NV - RR CDRHFM HR RS @ MC @ QC
- q Double suction available on all but smallest sizes
- q ( LOQNUDC - / 2 ' Q CDRHFMR @ U @ HK

**Radial Bearings**

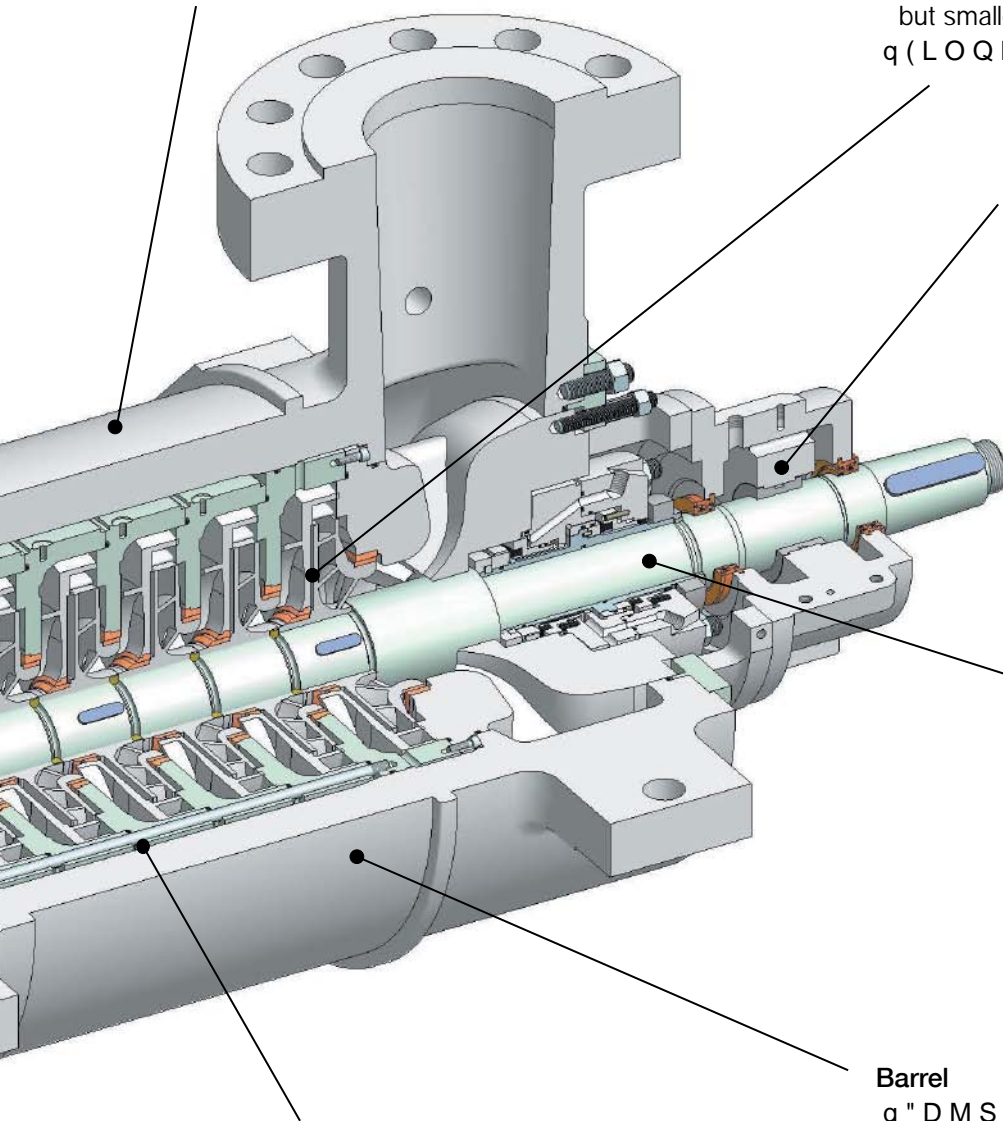
- q ( - / 1 . ¥ AD @ QHMF HRNK @ SN
- q " @ QANM RSDDK AD @ QHMF ; RTOONQS
- q Ring oil or oil mist lubricated roller NQ A @ KK AD @ QHMF VHSG
- q Ring oil or force feed lubricated sleeve bearings available

**Robust Shaft and Rotor**

- q Designed for low stress level
- q Fully machined
- q Dynamically balanced
- q Straight bore, tapered bore, or GXCQ @ TKHB jS TMCDQ BN @ AKD ODQ ( 2 . / (

**Barrel**

- q " DMSDQKHMD LNTMSDC ENQ SGDQL @ MC L @ WHLTL MNYYKD KN @ C B @ C
- q " @ RS VHSG MNYYKDR @ MC k @ MFD
- q % NQFDC A @ QQDK VHSG - # \$ NE MN
- q @ @ @ @ TO kNV SGQNTFG CHRBG @ QF QDPHQDC ADKNV ; " ; % 6 @
- q " N @ QDDP @ H @ C ENQ GHFGDQ SDLC
- q " NTOKHMF GTA HMAN @ QC Q @ CH @ K @ A @ QHMF J @ M CRKNS SGDQL @ K DWO
- q Jacketing, insulation or noise blankets available



- 3 XPS , QQHU & DUWULGJH \$VVHPEO \
- q Stage casings sealed by discharge pressure
- q % QDD SN DWO @ MC SNV @ QCR CHRBG @ @ @ @ TO kNV SGQNTFG CHRBG @ QF
- q ( MMDQ SHD ANKSR ENQ @ RRDLAKX CHN @ QDDP @ H @ C ENQ GHFGDQ SDLC
- q " NTOKHMF GTA HMAN @ QC Q @ CH @ K @ A @ QHMF J @ M CRKNS SGDQL @ K DWO
- q inboard seal chamber removal required on small pumps to remove cartridge
- q Larger pumps have barrel bore diameters larger than bearing housing which allows cartridge to be removed with those parts assembled

\* 6 \* % DFN WR % DFN 'HVLJQ ) HDWXUHV DC

**Casing Cover**

q%K@MFDC GD@C RSTCR MTS  
q%K@MFDC GD@C 2TODQMTS  
q2TKYDQ R O@SDMSDC 3VHRS  
q. QHMF NQ ROHQ@K VNTMC F

**Axial Thrust Balance**

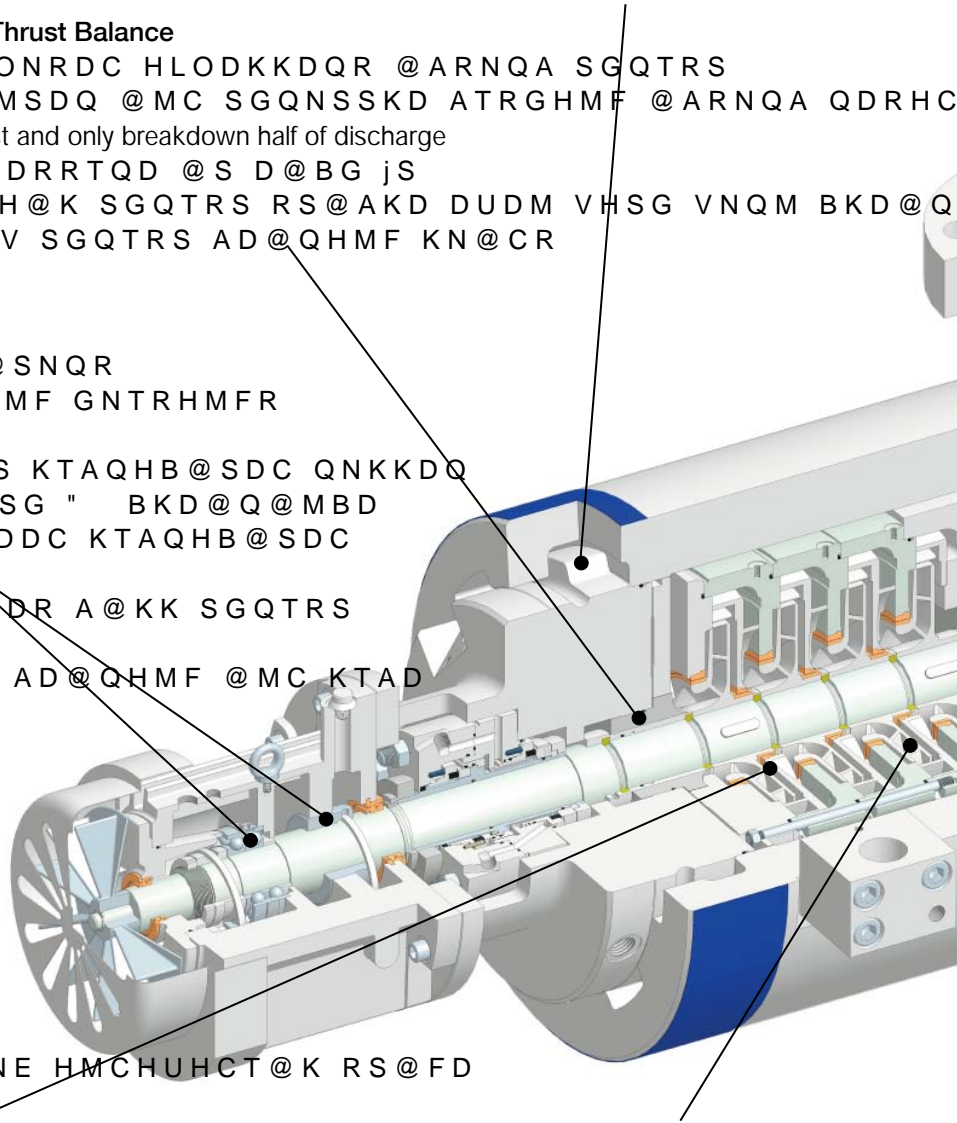
q.OONRDC HLODKKDQR @ARNQA SGQTRS  
q"DMSDQ @MC SGQNSSKD ATRGHMF @ARNQA QDRHC  
thrust and only breakdown half of discharge  
OQDRRTQD @S D@BG jS  
q WH@K SGQTRS RS@AKD DUDM VHSG VNQM BKD@Q  
q+NV SGQTRS AD@QHMF KN@CR

**Bearings**

q(-/1.¥ AD@QHMF HRNK@SNQR  
q"@QANM RSDDK AD@QHMF GNTRHMFR  
VHSG ; RTOONQS  
q1HMF NHK NQ NHK LHRS KTAQHB@SDC QNKKDQ  
NQ A@KK AD@QHMF VHSG " BKD@Q@MBD  
q1HMF NHK NQ ENQBD EDDC KTAQHB@SDC  
sleeve bearing  
q% @M BNNKDC RDQHDR A@KK SGQTRS  
bearing has low loads and long life  
q3HKSHMF O@C SGQTRS AD@QHMF @MC KTAD  
system available on larger sizes

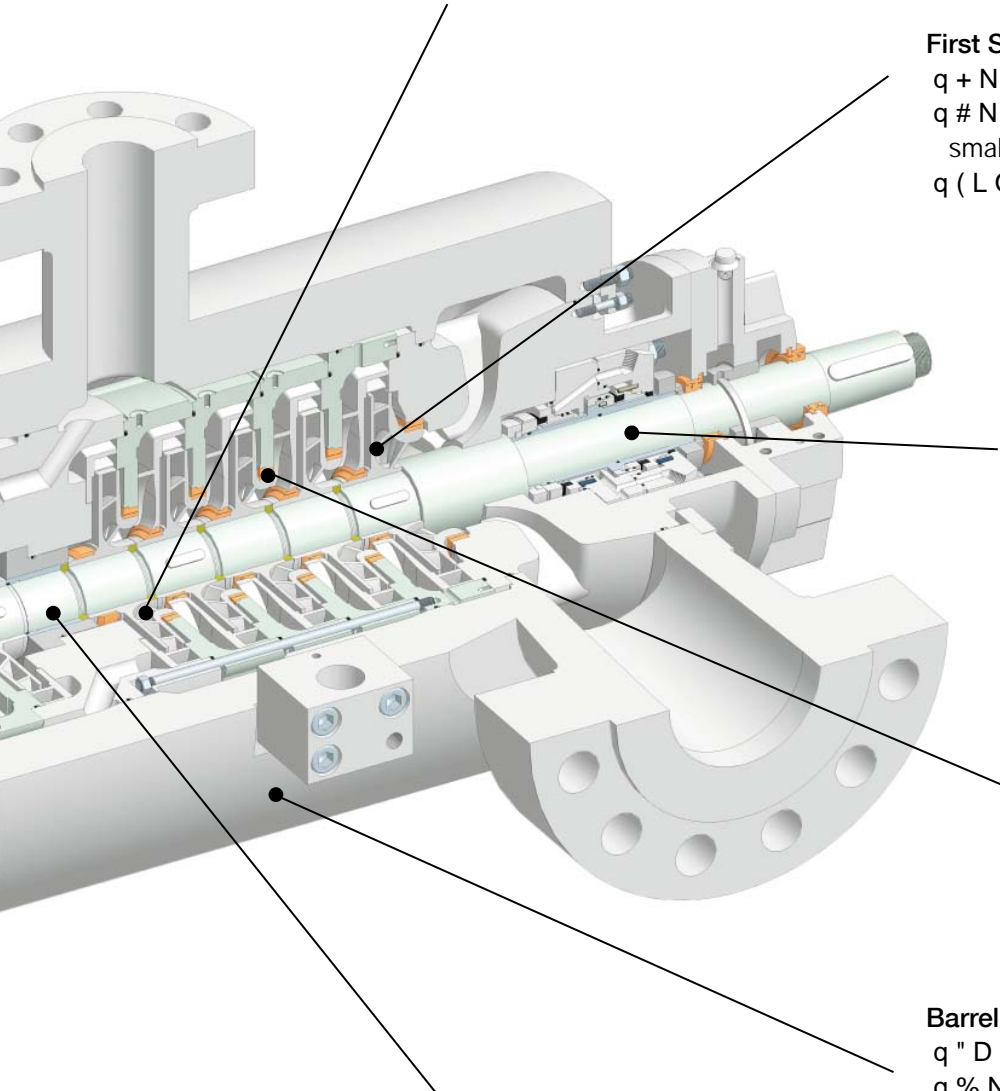
**Diffusers/Impellers**

q KKNV QDOK@BDLDMS NE HMCHUHCT@K RS@FD  
pieces vs. entire inner volute  
q ,HKKDC CHEETRDQR NM RL@KK RHYDR ENQ GX-  
CQ@TKHB @BBTQ@BX @MC DEjBHDMBX 3XPS ,QQHU &DUWULGJH \$VVF  
q. QHMF NQ LDS@K SN LDS@K CHEETRDQ jSR q@NHMSR RD@KDC AX CHRBG@  
q \*DX CQHUMD DMBKNRDC HLODKKDQR q%QDD SN DWO@MC SNV@QCF  
q%NQ '/( @OOKHB@SHNMR RGQHMJ jS @WH@KX during warm-up  
q(MMDQ SHD ANKSR ENQ @RR q"NTOKHMF GTA HMAN@QC Q  
secured impellers and stepped shaft  
at each stage  
q!K@MJ RS@FDR B@M AD RTOOKHDC ENQ inboard seal chamber removal required  
future conditions on small pumps to remove cartridge  
q+ @QFDQ OTLOR G@UD A@QQ ameters which allows cartridge to be  
removed with those parts assembled



**Back-To-Back Design**

q %NQ L@MX RS@FDR @MC NQ KHFGS FQ@UHSX kTHCR NQ QDLNSD  
 applications where lube oil systems are not desired  
 q #Q@L@SHB@KKX HLOQNUDR QNSNQ CXM@LHBR † DUDM VHSG  
 worn clearances on light hydrocarbons  
 q KKNVR LNQD RS@FDR @S CHQDBS CQH UD LNSNQ RODDCR GHFG  
 speed with lube system may not be required —  
 RTARS@MSH@K jQRS BNRS @MC L@HMSDM@MBD R@UHMFR



**First Stage Impeller**

q +NV -RR CDRHFM HR RS@MC@QC  
 q #NTAKD RTBSHNM @U@HK@AKD  
 smallest sizes  
 q (LOQNUDC -/2'Q CDRHFMR @U@H

**Robust Shaft and Rotor**

q #DRHFMD ENQ KNV RSQDF  
 q %TKKX L@BGHMDC  
 q #XM@LHB@KKX A@K@MBDC  
 q 2SQ@HFGS ANQD S@ODQD  
 GXCQ@TKHB jS TMCDQ BNT  
 @U@HK@AKD ODQ (2.

**Wear Rings**

q 1DOK@BD@AKD RS@SHNM@  
 rotating wear rings

**Barrel**

q "DMSDQKHMD LNTMSDC NM GNS  
 q %NNS LNTMSHMF @U@HK@AKD  
 q " @RS VHSG MNYKDR @MC k@M  
 q %NOFDC A@QQDK VHSG -#\$ NE M  
 welds — side, top and other nozzle  
 BNMiFTQ@SHNMR @U@HK@AKD  
 k@MFD HMSDQEDQDMBD NQ RHL

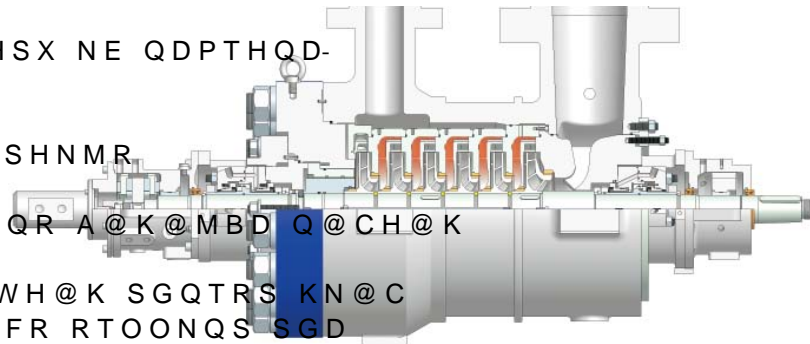
**Center and Throttle Bushings**

q \$WBDKKDMS QNSNQ CXM@LHB ADG@UHNQ  
 q 1DCTBDC VD@Q  
 q WH@K SGQTRS A@K@MBD DUDM  
 worn clearances

\* 6 \* , Q O L Q H D Q G % D F N W R % D F N ' H V L J Q

**GSG Inline**

q % T K j K K R S G D L @ I N Q H S X N E Q D P T H Q D -  
 ments for BB5 pumps with either  
 cast or forged barrels to meet  
 B T R S N L D Q R O D B H j B @ S H N M R



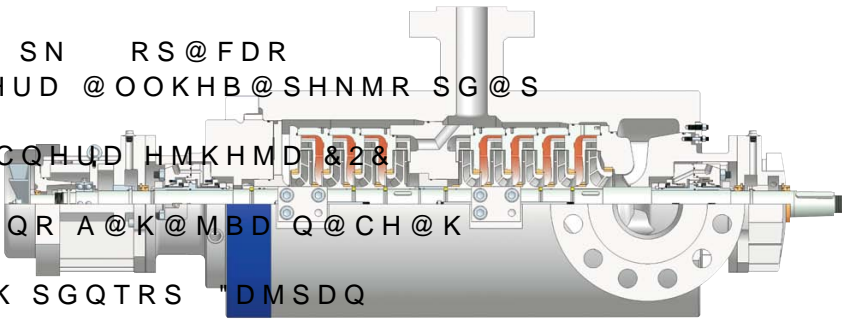
q , T K S H U @ M D C H E E T R D Q R A @ K @ M B D Q @ C H @ K  
 loads. Balancing drum takes  
 S G D L @ I N Q H S X N E @ W H @ K S G Q T R S K N @ C  
 ' D @ U X C T S X A D @ Q H M F R R T O O N Q S S G D  
 rotor and carry residual thrust  
 loads.

q 2 L @ K K D Q R H Y D O T L O R , S W I C T V H M S T G L A D Q N E H M S D Q U D Q X G H F G G D @ C @ M  
 ring oil lubricated antifriction bearings. Oil mist lubrication optional. changeable stage pieces mini- mizes spare parts inventory. D M D Q F X K D U D K R A D X N M C  
 to-back direct drive capabilities,  
 & 2 & V H S G R D L H R S H E E Q N

q K K A T S R L @ K K D R S R H M D R C H L @ D B S D C Q H U D @ O O K H B @ S H N M R F B K / B @ Q K X C  
 j S S D C V H S G O Q D R R T Q D e k e t A s e c t i o n s t o c k B @ M A D N E E D Q D C " N T K C I  
 sleeve radial, double acting tilting pad thrust bearings, lube oil systems, bearing RTD's, X-Y vibration probes and Keyphasor, etc. K H L H S R ( E R S H K K L N G t a n d S i n g l e R n i t M D C D C  
 j Q R S B N M R H C D Q & 2 & A s t a n b y S i n u s i o l R o m m e n d -  
 @ M C C H Q D B S C Q H U D @ E S G @ S C N D R M N S  
 meet head requirement, then  
 B N M R H C D Q & 2 & H M K H M D V H S G G H F G D Q  
 R O D D C T R H M F F D @ Q A N W N Q 5 % #

**GSG Back-to-Back**

q U @ H K @ A K D V H S G T O S N R S @ F D R  
 E T K j K K R C H Q D B S C Q H U D @ O O K H B @ S H N M R S G @ S  
 require more head than is avail-  
 @ A K D E Q N L C H Q D B S C Q H U D H M K H M D & 2 &



q , T K S H U @ M D C H E E T R D Q R A @ K @ M B D Q @ C H @ K  
 loads. Opposed impellers balance  
 L @ I N Q H S X N E @ W H @ K S G Q T R S " D M S D Q  
 bushing and throttle bushing take  
 M D @ Q K X @ K K S G D Q D R H C T @ K @ W H @ K S G Q T R S

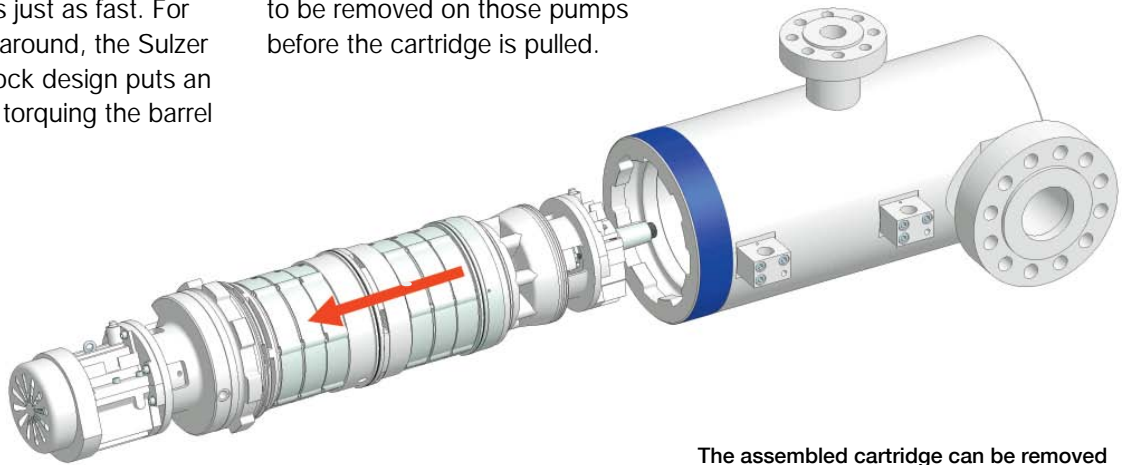
Even when clearances are worn, limits, or Sulzer limits depending or cannot meet rotordynamic  
 @ W H @ K @ M C Q @ C H @ K T I O N @ C @ O O K H B @ S H N M Q 2 H F T M H Q B @ D M S S R X @ D & 2 & V H  
 anced. duces installed cost and provides stiff back-to-back rotor can be  
 simple, reliable pumps. offered.

q % @ M B N N K D C Q H M F N H K K T A Q H B @ S D C  
 sleeve / ball thrust bearing with- q 6 G D M D U D M G H F G R O D D C & 2 &  
 out lube systems are common up with semi-stiff inline rotor does  
 S N ( 2 . / ( S @ A K D meet head requirements,

# Rapid Pump Dismantling

3N RODDC SGD QDO @ Hove Nits @ For 28  
 pump, larger sizes are designed using that cartridge concept. The pump coupling hub, inboard bearing housing, seal chamber and hydraulic cartridge slide through the barrel for quick removal. Re-installation is just as fast. For even faster turnaround, the Sulzer patented Twistlock design puts an end to hours of torquing the barrel

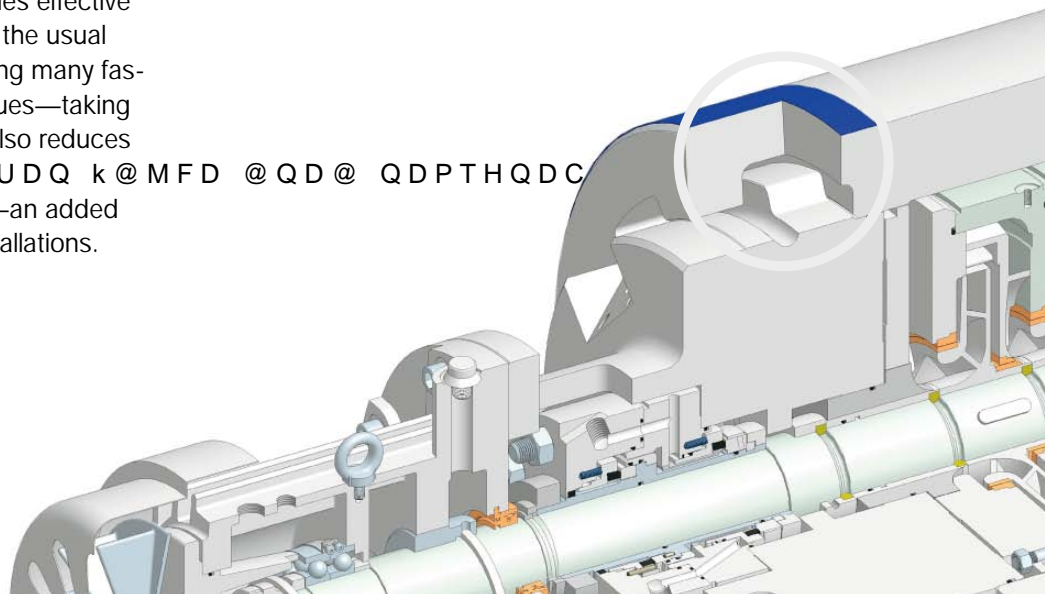
or offshore applications this can be especially time and cost saving. 2L @ KK & 2 & OTLO A @ QQDK ANQD @ QD so small that the coupling hub, seal chamber and bearing housing will MNS jS SGQNTFG 3GNRD O @ QSR G @ UD to be removed on those pumps before the cartridge is pulled.



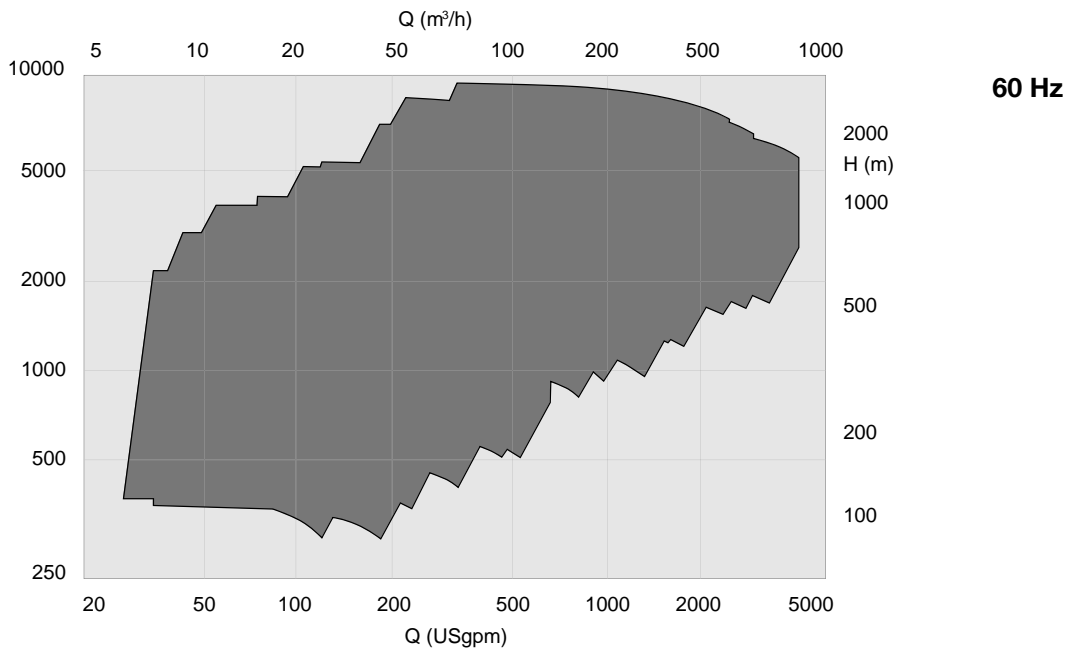
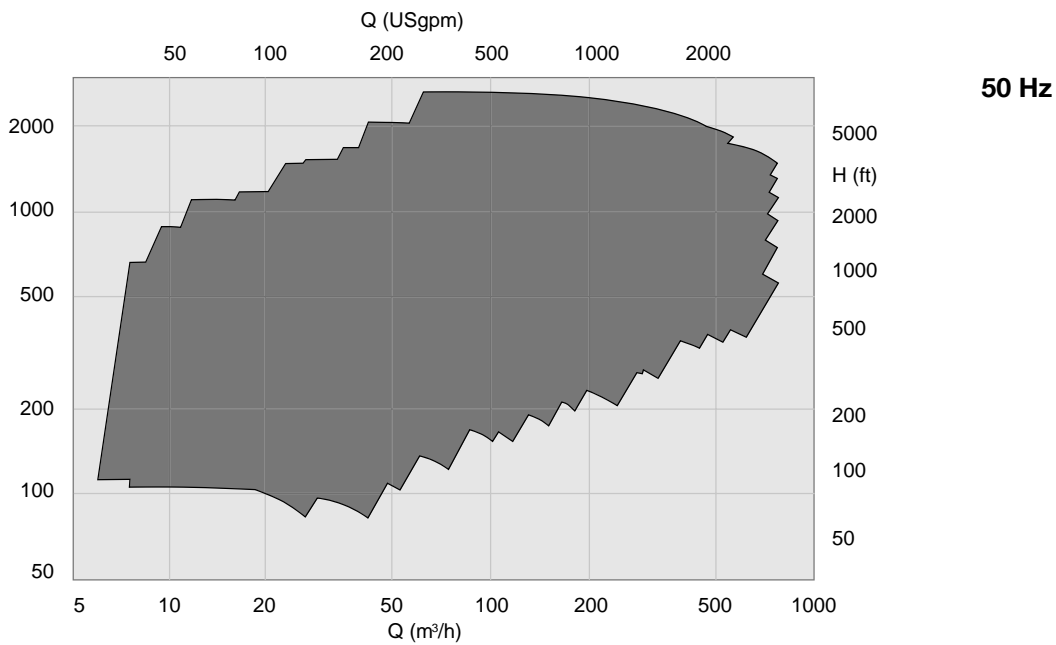
The assembled cartridge can be removed as one piece on larger pumps

# Sulzer's Patented Twistlock

The innovative Sulzer Twistlock barrel cover design provides effective sealing and eliminates the usual requirements of torquing many fasteners to very high values—taking hours. The Twistlock also reduces SGD DMC BNUDQ k @ MFD @ QD @ QDP THQDC thus reducing weight—an added bonus for offshore installations.



# GSG Performance Range



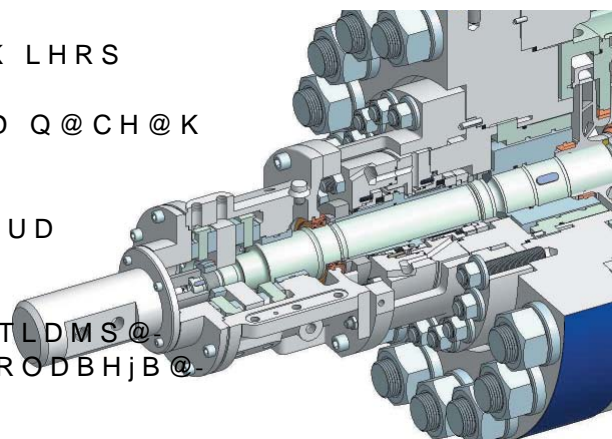
## Operating Data

	50 Hz		60 Hz	
/TLO RHYD	SN	LL	SN	HMBGDR
" @O@BHSX	TO SN	GL	TO SN	42FOL
'D@C	TO SN	L	TO SN	EDDS
/QDRRTQD	TO SN	A@Q	TO SN	ORH
3DLODQ@STQD	" SN	"	% SN	%

# GSG Options

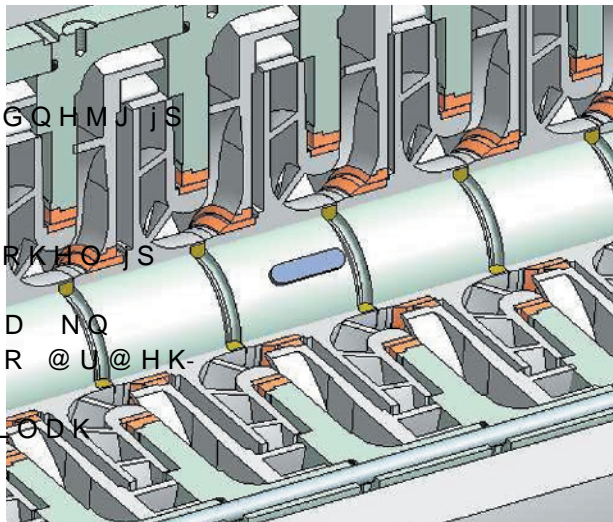
## Bearing Options

- q % @ M BNNKDC QHMF NHK NQ NHK LHRS  
lubricated antifriction bearings
- q 1HMF NHK KTAQHB@SDC RKDDUD Q@CH@K  
bearings with antifriction thrust bearing
- q % NQBD EDDC KTAQHB@SDC RKDDUD  
radial bearing and double acting tilting pad thrust bearing
- q U@QHDSX NE AD@QHMF HMRSQTLDM S@ SHNM HR @U@HK@AKD SN LDDS RODBHjB@  
tions



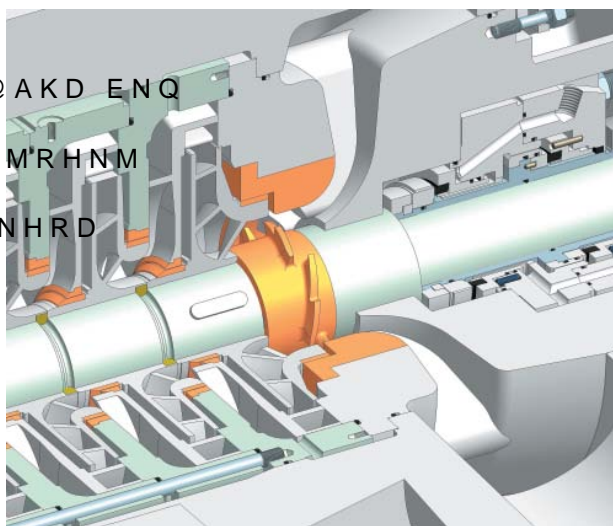
## Rotor and Impeller Options

- q % NQ (2. / ( @OOKHB@-  
tions, impellers are individually @WH@KKX RDBTQDC @MC @QD RGQHMJjS  
to the shaft — which is stepped under each impeller for ease of assembly
- q % NQ NSGDQ @OOKHB@SHNMR @ RKHOjS  
impeller stack is available
- q 2SQ@HFGS ANQD S@ODQDC ANQD NQ GXCQ@TKHB jS BNTOKHMF GTA HR @U@HK@AKD ODQ (2. / (  
q #NTAKD 2TBSHNM jQRS RS@FD HLQDK  
KDQ ENQ KNVDQ -/2'Q



## High Temperatures and Options for Bottoms / Residues

- q /QNUDM BNJD BQTRGDQ @U@HK@AKD ENQ  
services with coke particles
- q /HM @MC AKNBJ SGDQL@K DWO@M'RHNM  
system provided on hot services
- q ) @BJDSHMF HMRTK@SHNM NQ MNHRD  
blankets available



**motralec**

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[www.motralec.com](http://www.motralec.com)