

Sandvik CH840i

Cone crushers

Sandvik CH840i is a technologically advanced, high capacity mid-range cone crusher for secondary and tertiary crushing, designed for crushing applications in mines or large sized quarries.

Each crusher has a hydraulically supported main shaft which is supported at both ends. With a robust design, adjustable eccentric throw, a constant intake opening, high performance can be achieved by proper selection of a Sandvik OEM crushing chamber.

The CH840i brings you a revolution in intelligent crushing. SAM by Sandvik gives you complete 24/7 access to data generated by your connected Sandvik crusher fleet. Now you can make decisions based on facts, and clearly see areas where you can improve uptime and productivity. SAM by Sandvik also gives you access to manuals and an e-commerce platform for easily and efficiently buying and reordering wear and spare parts. It lets you track and trace parts online to make maintenance planning simpler.

The CH840i comes with the new generation Automation and Connectivity System as standard. The system continuously monitors and optimizes crusher performance and controls the complete lubrication system, increasing uptime and reliability. It can automatically adjust crusher settings to compensate for crushing chamber wear, ensuring consistent product size. Hydroset™ and the advanced dump valve automatically provide overload protection to let tramp iron or other uncrushable material pass through.

Bolted rather than welded top and bottom shell liners reduce maintenance time and are much safer. It's 90% faster to change liners compared to welding.

The improved over-pressure system with dedicated air channel inlets keeps dust out to increase reliability. The standard off-line filter unit keeps lubrication oil cleaner with 24/7 fine filtration, reducing wear on your internal crusher components and extending oil life by up to 5 times.



KEY FEATURES		
Automation & Connectivity System (ACS-c)	Automatically adapts the crusher to varying feed conditions ensuring maximum 24/7 performance.	
Hydroset™ system	Provides safety and setting adjustment functions	
Mainframe is built as a unibody without moving parts.	For optimal strength and less components requiring maintenance.	
Top serviceability.	Lifting from above minimizes risks, and allows for quicker and safer maintenance.	
Adjustable eccentric throw.	To exactly balance capacity to the process thus harmonizing the crushing stages.	
Constant liner profile.	Maintains the feed opening and performance during the entire service life of the liners.	
Wide range of crushing chambers suited for all types of applications.	Choose from extra coarse crushing chambers with the largest intake to extremely fine crushing chambers.	
PLC controlled electric dump valve for tramp iron protection.	Reduces pressure peaks and mechanical stress on the crusher, greatly improving reliability.	
Full lubrication monitoring and control.	Real-time monitoring of the crusher lubrication system for increased uptime and reliability.	

GENERAL INFORMATION

General design criteria			
Crusher type	Cone crusher, hydraulically adjusted.	Eccentric bushings (Throws – mm)	• 28, 32, 36 • 36, 40, 44 • 44, 48, 52
Application	Minerals processing.	Eccentric speed	327 rpm (50 Hz, SPC-belt) 332 rpm (60 Hz, SPC-belt) 331 rpm (60 Hz, 8V-belt)
Crushing stage	Secondary, tertiary, quaternary, pebble.	Max. motor power	330 kW
Max. feed size	250 mm	Drive	Direct
CSS range	10-48 mm	Safety coupling	Omega
Nominal capacity*	103-427 mtph	Pinion shaft speed	1,470 rpm (50 Hz, SPC-belt) 1,494 rpm (60 Hz, SPC-belt) 1,491 rpm (60 Hz, 8V-belt)
Ambient temperature	-20°C to +40°C (Contact Sandvik if outside range)	Drive	V-belt or direct
Altitude of site	≤ 2000 m (Contact Sandvik if outside range)	Subframe	With rubber dampers.
* Capacity is dependent on the crushing chamber, the eccentric throw, the crusher’s setting and the feed material’s bulk density, crushability, size analysis, moisture content, etc.		Maintenance tool box	Extractor for eccentric bushing. Extractor for bottom shell bushing. Extractor for step bearing. Additional lifting and maintenance tools included.
General crusher data			
Weight	20,728 kg	Crushing chambers	
Main frame	Two-part unibody structure without moving parts. Cast steel.	Mantle alternatives	A, B, FlexiFeed B
Top shell	Two-arm design.	Concave alternatives	EC, C, MC, M, MF, F
Bottom shell	Five-arm design. Two inspection hatches.	Alloys for mantles and concaves	M1, M7, M9
Feed hopper	Rubber/steel lined steel hopper. Two inspection doors.	Mantle and concave backing material	Plastic free, metallic contact.
Feed level sensor	Vegapuls 31	Lifting tools for mantle.	Available as option.
Main shaft	Supported at both ends. Top spider bearing and bottom eccentric bearing.		

CRUSHER DRIVE SYSTEM

Motor Characteristics	
Manufacturer	WEG
Model	W22/W51
Type	Three-phase, squirrel cage.
Weight	1,878-2,747 kg
Rated power	330 kW
Frequency	50/60 Hz
Poles	4
Vibration resistance	Motor is supplied with special winding that is reinforced in order to support the vibration levels.
Insulation class	F
Protection class	IP55

CRUSHER DUST EXCLUSION

System Characteristics	
Type	Dust seal air pressure.
Air input	Blower
Air quality	Filtered
Air flow	<70 m³/min
Air pressure	<10 kPa
Weight (blower, hoses)	25 kg
Motor power	0.75 kW
Motor speed	2,800 rpm (50Hz), 3,350 rpm (60Hz)
Phases	3
Insulation class	F
Protection class	IP55

CRUSHER TRAMP IRON PROTECTION

Mechanical dump valve	
System description	Mechanical spring loaded hydraulic valve.
Electric dump valve	
System description	Electrically controlled hydraulic valve.
Pressure transmitter and an electric pilot valve connected to a dedicated, rapid sampling PLC system.	
Hydraulic pressure sampling rate	200 times per second
Mechanical assembly	
Weight	48 kg
Dimensions (LxWxH)	250x360x470 mm
Heating elements	1 x 200 W

CRUSHER WEAR PROTECTION

Feed hopper	
No. of rubber liners	16
Max. weight	8 kg
Material	Sandvik WT7000 rubber
Fastening method	Bolted
Cone liner	
No. of rubber liners	20
Max. weight	9-10 kg/4-5 kg
Material	Hardox or Sandvik WT7000 rubber (option)
Fastening method	Bolted
Top shell spider cap	
Max. weight	198 kg
Material	Carbon steel
Fastening method	Bolts, seal with O-ring
Top shell arm shields	
No. of shields	2
Max. weight	84 kg
Material	Manganese Steel
Fastening method	Bolted
Bottom shell body liners	
No. of liners	10
Max. weight	16-24 kg/5-7 kg
Material	Wear-resistant hardened steel or Sandvik WT6000 rubber (option)
Fastening method	Bolted
Bottom shell arm liners	
No. of liners	5
Max. weight	80-83 kg
Material	Manganese steel
Fastening method	Bolted (weldig*)
* No main frame welding.	

TANK UNIT	
General data	
Supplies oil to the main lubrication system. Pinion lubrication systems and to the hydroset system	
No. of doors	3
No. of inpection hatches	2 located on top of unit.
Cabinet material	Metal
Tank unit dimensions (LxWxH)	1,980x1,130x2,000 mm
Dry weight	865 kg
Hydroset system	
System design	Single reversible pump
Oil tank reservoir capacity	85 liters
Pump design	Gear pump
Pump capacity	10.4 l/min (50Hz), 12.6 l/min (60Hz)
Oil filter	
No. of filters	1
Filter type	Spin-on
Filter grade	10 µm
Filter material	Glass fiber
Pump motor	
Type	Three-phase, squirrel cage
Power	3 kW @50 Hz, 3.6 kW @60 Hz
Speed	1,500 rpm (50 Hz), 1,800 rpm (60 Hz)
Poles	4
Insulation class	F
Protection class	IP55
Main crusher lubrication system	
System design	Closed circuit, single pump, gravity return.
Oil tank reservoir capacity	400 liters
Pump design	Gear pump
Standby pump	N/A
Pump capacity	112 l/min (50 Hz), 135 l/min (60 Hz)
Pump motor	
Type	Three-phase, squirrel cage
Power	4 kW @50 Hz, 4.8 kW @60 Hz
Speed	1,500 rpm (50 Hz), 1,800 rpm (60 Hz)

Insulation class	F
Protection class	IP55
Oil filters	
No. of filters	1
Filter type	Filter element insert
Filter grade	25 µm
Filter material	Glass fiber
Oil heaters	
No. of heaters	2 (optional 3)
Type	Immersion heater
Rating	1.65 kW
Istallation type	Immersion heater tube
Phases	3
Pinionshaft lubrication system	
System design	Closed circuit, single pump, gravity return
Oil tank reservoir capacity	52 liters
Pump design	Gear pump
Pump capacity	0.9 l/min (50 Hz), 1.1 l/min (60 Hz)
Pump motor	
Type	Three-phase, squirrel cage
Power	0.12 kW @50 Hz/@60 Hz
Speed	1,500 rpm (50 Hz), 1,800 rpm (60 Hz)
Insulation class	F
Protection class	IP55
Oil filters	
No. of filters	1
Filter type	Spin-on
Filter grade	10 µm
Filter material	Glass fiber

OIL COOLING SYSTEMS (For main crusher lubrication)	
Standard air/oil coolers	
No. of units	1
Dry weight (incl. stand)	240 kg
Material	Aluminum
Oil volume	12.8 liters
Max. air flow	2.8 kg/s @50 Hz, 3.3 kg/s @60 Hz
Air cooler fan motor	
Type	Three-phase, squirrel cage
Power	2.2 kW @50 Hz, 3.6 kW @60 Hz
Speed	1,500 rpm (50 Hz), 1,800 rpm (60 Hz)
Hot climate ai/oil coolers	
No. of units	1
Dry weight (incl. stand)	390 kg
Material	Aluminum
Oil volume	19.0 liters
Max. air flow	7.8 kg/s @50 Hz, 9.3 kg/s @60 Hz
Air cooler fan motor	
Type	Three-phase, squirrel cage
Power	5.5 kW @50 Hz, 6.3 kW @60 Hz
Speed	1,500 rpm (50 Hz), 1,800 rpm (60 Hz)

OFFLINE FILTER UNIT FOR MAIN LUBRICATION	
Purpose	Removes particles, degrading particles, and water from the main lubrication system in a continuous slow offline filtration process
Model	27/54
Oil capacity	20 liters
Dimensions (LxWxH)	650x450x1,055 mm
Weight	100 kg
Pump design	Gear wheel
Oil filters	
No. of filters	2
Filter type	Filter insert
Filter grade	3 µm
Filter material	Cellulose
Filter housing material	Cast iron

Pump motor	
Type	Three-phase, squirrel cage
Capacity	200 @50 Hz, 240 @60 Hz
Speed	915 rpm (50 Hz), 1,120 rpm (60 Hz)
Protection class	IP55
MANUALS	
Operator’s manual	Any language
Installation manual	Any language
Installation manual appendix	Any language
Maintenance manual	Any language
Spare parts catalogue	English only

Automation and Connectivity System (ACS-c)

System alternatives

- Turn-key / Integrated
- CE marked / UL compliant
- Supply voltages
 - 380 – 690 V AC 3-phase
 - 110 – 240 V AC 1-phase
 - 50/60Hz
- Network communication cables
 - Profinet CU cables
 - 10 (33), 20 (66), 30 (98), 50 (164), 100 (328) meter (Feet)
 - Fiber optic FO cables
 - 50 (164), 100 (328), 150 (492), 200 (656), 250 (820), 300 (984) meter (Feet)

Features

- One system for complete crusher control
- GUI in Metric/US units and standard languages
- Crusher reliability with proven automatic setting regulation
 - Control modes and programs for constant CSS or maximized reduction
 - Automatic liner wear compensation
 - Automated setting calibration
- Clarified responsibility with roll-based interaction
 - Operator
 - Maintenance
 - Engineer
- Increased availability with optimized alarm management
 - 9 different alarm classes
 - Sensor alarm bypass
- Tools to simplify trouble-shooting and optimization
 - Detailed information
 - Alarms recommended actions
 - Historical trends
 - Alarm and event log
 - User instructions with search
- Full supervision and remote operation with seamless wintegration to plant
 - Supervision of 500 signals
 - Remote control
 - Communication monitoring
 - Plant system clock synchronization

Setting regulation

- Setting regulation monitoring and control
 - Hydroset pressure
 - Main drive power
 - Main shaft position
 - CSS
 - Tank oil level
- Feed material level monitoring and control
- Top shell spider bearing monitoring
 - Temperature
- Main drive monitoring
 - Power
 - Rotation
 - Factor
 - Phase angle
- Emergency stop system

Lubrication control

- Main lubrication monitoring and control
 - Oil pressure
 - Oil filter pressure
 - Oil inlet temperature
 - Oil inlet flow
 - Oil return temperature
 - Oil return flow
 - Tank oil temperature
 - Tank oil level

- Pinion lubrication monitoring and control
 - Oil pressure
 - Oil filter pressure
 - Oil temperature
 - Tank oil level

- Dust seal air pressure monitoring and control
 - Air pressure in crusher

- Off-line filter monitoring and control
 - Oil filter pressure

Dump valve control

- Dump valve monitoring and control
 - Hydroset pressure
 - Assembly temperature
 - Directional valve

Connectivity to SAM

- Gateway for transfer of equipment data thru 4G/3G/2G

Integration to plant control system

- Hard wired digital input/output signals
 - Permissions
 - Status
 - Alarm sum
 - Commands
 - Feedback
- Field bus protocols
 - ControlNet
 - DeviceNet
 - EtherNet/IP
 - Modbus TCP
 - Modbus RTU
 - Profibus DP
 - Profinet
- Remote user interface
 - HTML5
 - OPC DA Server software (optional)
 - WINI software (optional)

Equipment dimensions

- Operator panel (IP65)
- Electrical cabinet, setting regulation (IP66)
- Electrical cabinet, lubrication control (IP66)
- Electrical cabinet, dump valve control (IP66)
- Setting control box (IP66)
- Emergency stop reset box (IP66)
- Sensor connection box (IP66)
- Connectivity box (IP66)
- Antenna router box (IP67)
- Network switch box (IP66)
- Tank connection box (IP66)
- Power measurement unit (IP20)
- Signal exchange unit (IP20)
- Tank sensor connection unit (IP65)

W x H x D - mm (in)

- 357 (14.07) x 290 (11.42) x 60 (2.36)
- 1200 (47.24) x 600 (23.62) x 250 (9.84)
- 1200 (47.24) x 800 (31.50) x 250 (9.84)
- 760 (29.92) x 600 (23.62) x 350 (13.78)
- 80 (3.15) x 170 (6.69) x 65 (2.56)
- 80 (3.15) x 140 (5.51) x 65 (2.56)
- 600 (23.62) x 300 (11.81) x 155 (6.10)
- 300 (11.81) x 300 (11.81) x 210 (8.27)
- 160(6.30) x 280 (11.02) x 160 (6.30)
- 300 (11.81) x 300 (11.81) x 210 (8.27)
- 300 (11.81) x 600 (23.62 x 155 (6.10)
- 250 (9.84) x 130 (5.12) x 101 (3.98)
- 585 (23.03) x 375 (14.76) x 130 (5.12)
- 385 (15.16) x 275 (10.83) x 51 (2.01)

PERFORMANCE

CH870i – nominal capacity* (mtph)

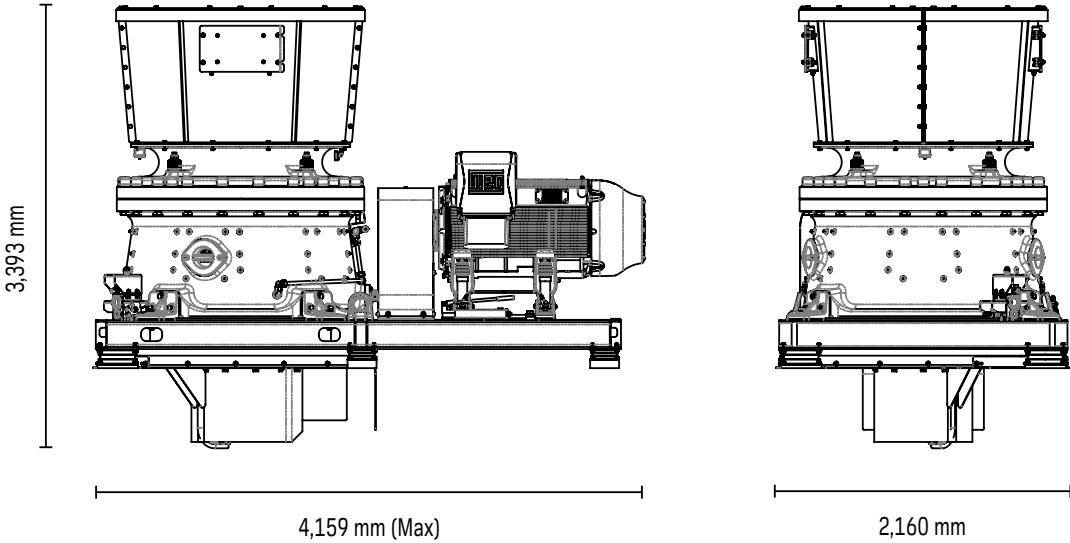
	Concave	EC	C	MC	M	MF	F
Max. feed size (mm)	F85***	141	116	81	-	-	-
	F90	172	141	127	105	97	73
	F100	250	205	159	131	121	92
Max. motor power (kW)		330	330	330	330	330	330
Eccentric throw (mm)		28-52	28-52	28-52	28-52	28-52	28-52
CSS (mm)							
	8	-	-	-	-	-	103-132
	10	-	-	-	-	-	109-170
	13	-	-	-	-	155-227	119-185
	16	162-193	177-210	187-254	197-307	167-261	128-200
	19	174-272	190-297	201-313	211-330	180-280	137-214
	22	186-290	203-317	214-334	226-352	192-299	147-215
	25	198-309	216-337	228-356	240-352	204-299	156-214
	29	214-334	233-364	246-384	259-332	220-282	169-200
	32	226-352	246-384	260-406	274-299	233-254	178
	35	238-371	259-356	274-427	288	245	-
	38	250-366	272-349	287-421	-	-	-
	41	261-335	285-312	301-385	-	-	-
	44	273-324	298	315-374	-	-	-
	48	289	-	333	-	-	-
	Mantle	A/B/FF	A/B/FF	A/B/FF	A/B	A/B	A/B

* based on material with bulk density of 1,600 kg/m3
** Additional feed size requirement applicable for FF mantle only (FlexiFeed)

WEIGHT (KG)	Kg	Lb
Top shell assembly	6,358	14,017
Bottom shell assembly	5,772	12,725
Main shaft assembly	4,201	9,262
Pinion shaft housing assembly	244	538
Hydroset cylinder assembly	1,080	2,381
Feed hopper assembly	1,440	3,175
Eccentric assembly	795	1,753
Dust collar assembly	239	527

Hoses and protection assembly	51	112
Crusher weight	20,278	44,706
Subframe	1,384	3,051
Electric motor (max.)	2,747	6,056
Tolat weight (incl. subframe and drive)	25,268	55,707

Dimensions*



* Always refer to the installation manuals

