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**“YASHIL ENERGETIKA VA UNING QISHLOQ VA SUV XO‘JALIGIDAGI
O‘RNI” MAVZUSIDAGI XALQARO ILMIY VA ILMIY-TEXNIKAVIY
ANJUMANI**

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LENTALI QURITGICH AVTOMATLASHTIRISHNING FUNKSIONAL SXEMASI VA YOZUVINI ISHLAB CHIQISH

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Annotatsiya. O'zbekiston Respublikasida lentali quritgichning ahamiyati, holati va rivojlantirish masalalari bugungi kunda davlatimizda muhimligi va bunga doir yechilayotgan muammolar ko'rib chiqilgan va mavzuning dolzarbligi, masalaning qo'yilishi, bitiruv malakaviy ishining maqsadi, masalalari, qo'llanayotgan usullar, ishning amaliy ahamiyati keltirilgan.

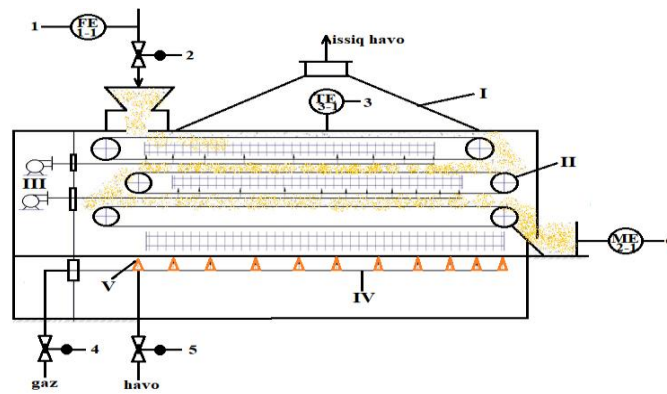
Kalit so'zlar. Elektrodvigatel, datchik.

Аннотация. Рассмотрены значение, состояние и развитие ленточных сушилок в Республике Узбекистан, их значение в нашей стране на сегодняшний день, а также решаемые в связи с этим проблемы. Представлены актуальность темы, постановка проблемы, цели работы, использованные методы, практическая значимость работы.

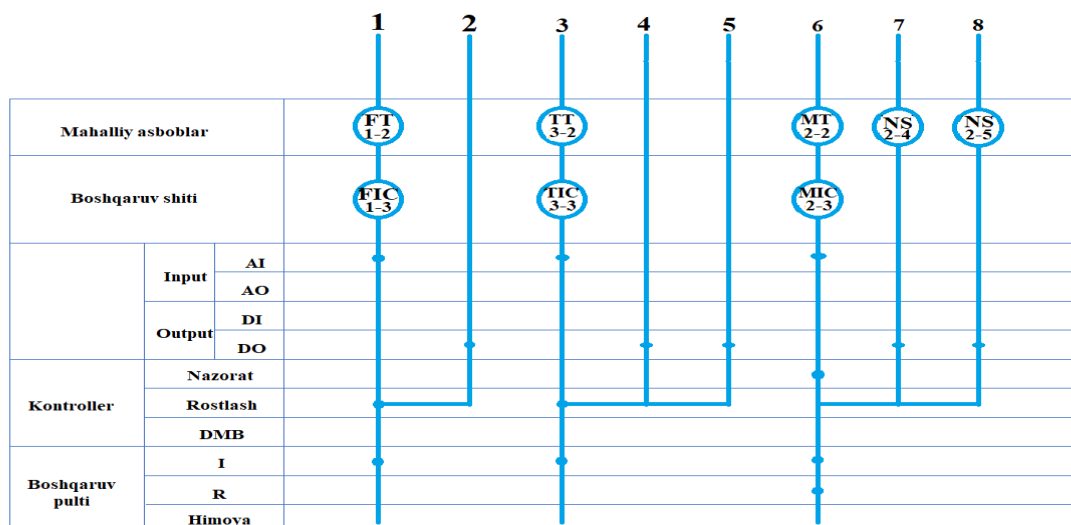
Ключевые слова. Электродвигатель, насос, датчик,

Turli xil texnologik jarayonlarda issiqlikni konvektiv usul bo'yicha uzatadigan quritkichlar (purkovchi, qaynovchi qatlamli, barabanli, konveyerli) keng tarqalgan. Quritishni avtomatik rostlashning eng yaxshi sxemalari quritilayotgan materialning namlik miqdorini apparatdan chiqishda avtomatik tarzda o'lchash mumkinligidir. Bunda rostlash materialning chiqishdagi namlik miqdori bo'yicha amalga oshiriladi, bu esa berilgan darajada uning barqarorligini ta'minlaydi. Ko'pchilik hollarda material oqimida namlikni joriy o'lchash uchun namlik o'lchagich (vlagomer)lar bo'lmaganligi sababli materialning chiqishdagi namlik miqdorining qiymati haqidagi axborotni olish mumkin bo'lmaydi. Shuning uchun materialning namlik miqdorining quritishning turli parametrlari: temperatura va quritish uchastkasining nisbiy namligi bilan funktsional bog'lanishga asoslangan bilvosita usulini qo'llanishga to'g'ri keladi. Quritish juda uzoq vaqt (1soat atrofida) davom etadigan apparatlarda quritilayotgan materialning boshlang'ich parametrlari quritish agenti parametrlariga qaraganda ancha kam ta'sir ko'rsatadi. Shuning uchun quritish agenti parametrlarining barqarorlashuvi material namligining barqarorlashuvini ta'minlaydi (u quritkichda doimiy vaqt davomida saqlaganda) deb hisoblanadi. Quritish agenti (havo)ning temperaturasi va nisbiy namligi o'zaro bog'liq bo'lgani uchun berilgan qiymati uning nisbiy namligiga bog'liq holda o'zgaradigan havo temperaturasi ARS ni qo'llash maqsadga muvofiqdir. Quritish qurilmalarida eng samarali rostlovchi ta'sir issiqlik oqib kelishining o'zgarishi hisoblanadi. U bilan birga ishlatilgan havoni yangisi bilan almashtirish intensivligining o'zgarishidan, materialning havo aylanib o'tishi tezligi o'zgarishidan, materialning quritish fazasida ko'chishi tezligi o'zgarishidan foydalanish mumkin. Quritish lentada quritish jarayoni avtomatlashtirish ob'ekti sifatida yetarlicha murakkab xususiy hosilali differentsial tenglamalar bilan tavsiflanadi. Quritish lentaning modelini «issiq havo sarfi - materialning chiqishdagi namligi» kanali bo'yicha soddalashtirish uchun uni sof kechikishli ikkinchi tartibli nodavriy bo'g' ko'rinishida qabul qiladi. Bunda shuni ta'kidlab o'tish kerakki, quritish jarayoni ancha katta inertsionlik bilan ifodalanadi. Quritishda kirishda material namligiga va sarfiga quritish lentaga kelayotgan issiq havo parametrining o'zgarishi g'alayonlanuvchi ta'sir ko'rsatadi.

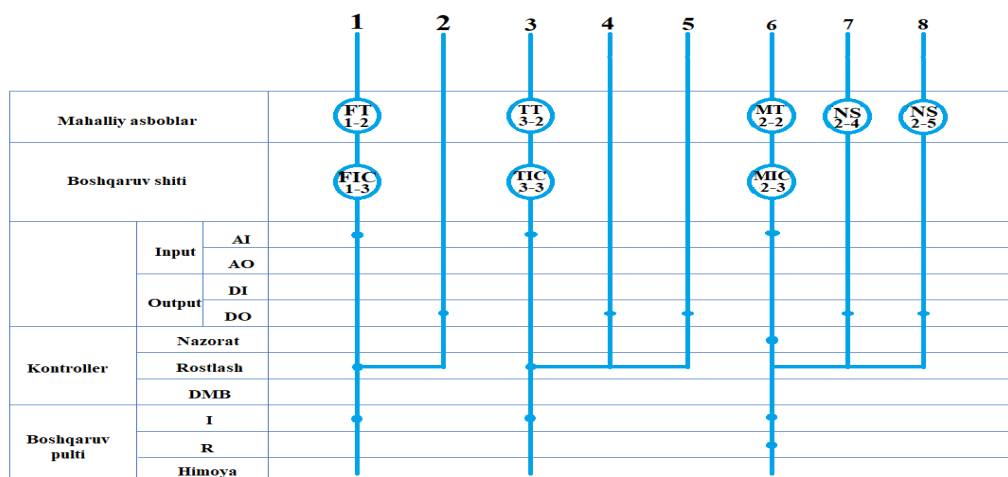
Birinchi ARS aralashtirish kamerasidagi issiqlik elitkich temperaturasini II lentaga kelib tushayotgan havo sarfiga ta'sir ko'rsatish bilan berilgan daraja saqlab turish uchun mo'ljallangan. 3-1 datchik lintaning oldingi qismidagi temperaturani nazorat qiladi.



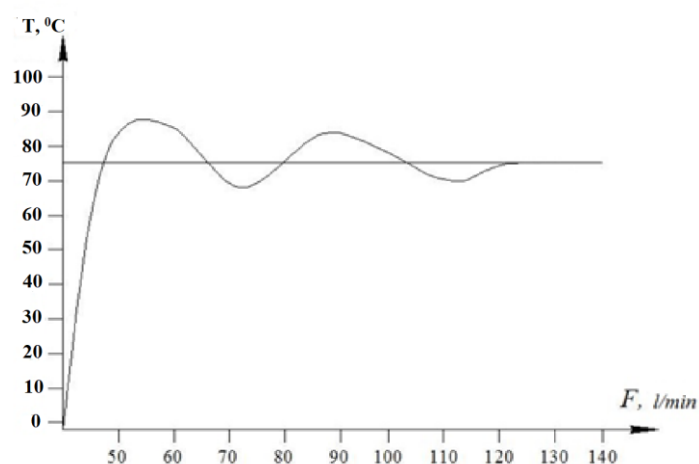
Datchikdan kelayotgan signal ikkilamchi asbob 3-2 ga va rostlagich 3-3 ga kelib tushadi, rostlagich esa havoning ventilyator VI ga uzatish chizig'idan drossell to'siqning (zaslonkaning) ijro mexanizmi 3-4 ni boshqaradi. Bunda bir vaqtda gazning yonishi uchun zarur havo uzatish, shuningdek aralashtirish kamerasiga kelayotgan havo uzatish o'zgartiriladi. Ikkinchi ARS kechikish kam bo'lgan va namlikning ancha qismi bug'lanib ketgan, demak, apparatdan quritish jarayoni haqida fikr yuritish mumkin bo'lgan lenta II ichidagi temperaturaga bog'liq holda o'choq IV ga gazni uzatishni o'zgartirish yo'li bilan quritishning issiqlik rejimini quvvatlab turadi. Datchik 2-1 dan chiqqan signal shchitga - ikkilamchi asbob 2-2 ga uzatiladi. Rostlash jarayoni quyidagi tarzda amalga oshiriladi. Agar xomashyo uzatish yoki uning namligi ortsa, u holda lenta ichidagi issiqlik elitkichning temperaturasi pasayadi va 2-3 rostlagich gaz uzatishni orttiradi (2-4 ijro qiluvchi mexanizm). Bu issiqlik elitkichining temperaturasini oshiradi, natijada rostlagich 3-3 linta ichidagi havo berilgan qiymatni qabul qilmaguncha havo sarfini orttirib turadi. Sxemada gazning bosimini yoqishdan avval stabilashtirish ko'zda tutilgan. ARS ga bosim datchigi 4-1 - chiqishli o'zgartirgichli monometr, ikkilamchi asbob 4-2 va rostlagich 4-3, forsunka V ga gaz uzatish chizig'idagi to'siq 4-4 ning boshqaruvchi mexanizmi kiradi. Sxemada, shuningdek tutun so'rgich I ning unumdorligini o'zgartirish yo'li bilan o'choqda siyraklashtirish ARS ko'zda tutilgan. Unga siyraklashtirish datchik 1-1, ikkilamchi asbob 1-2 va rostlagich 1-3 kiradi. Lentaning oldingi qismi temperaturasi o'lchashda rostlagich quritishning borishi haqidagi axborotni har doim ham olavermaydi. Shuning uchun ko'pchilik hollarda kaskadli ARS dan foydalaniladi, unda lintadan chiqishda issiqlik elitgichning temperaturasi rostlanadi, uning berilgan qiymati esa lentaning o'rtasidagi temperaturaga bog'liq holda tuzatiladi.



Lentali quritgich avtomatlashtirishning funksional sxemasi



Mavaning quritish harorati: 75 °C



3 -rasm Rostlash obyektining o'tish jarayoni

Amalda quritish uchun purkagich (to'zg'itish) quritkichlari keng qo'llaniladi. Mahsulotning turiga va unga qo'yiladigan talablarga bog'liq holda tayyor mahsulot sifatining asosiy ko'rsatkichlari namlik miqdori, fraksion tarkibi, boshlang'ich zichlik yoki fizika-kimyoviy ko'rsatkichlar hisoblanadi. Sanab o'tilgan bu ko'rsatkichlarni bevosita aniqlash uchun asosiy rostlovchi kattalik sifatida qurilmadan chiqishda material yoki gazlarning temperaturasidan foydalanish mumkin. Quritish qurilmalarining boshqa turlarini, masalan, qatlami qaynayotgan quritkichlarini avtomatlashtirishda rostlanuvchi kattalik sifatida qatlamdagi materialning temperaturasi tanlanadi. Rostlanuvchi ta'sir sifatida materialni quritgichga uzatishni o'zgartirish (agar quritgichning unumdorligini o'zgartirish mumkin bo'lsa), issiqlik elitgich sarfini va issiqlik elitgichning kirish temperaturasi o'zgartirish qabul qilingan

Foydalanilgan adabiyotlar ro'yxati

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CYBERSECURITY FOR SCADA SYSTEMS

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Annotation: *This article highlights the increasing need for cyber security in SCADA systems due to the growing threats and interconnectedness of industrial systems. It also provides an overview of best practices and regulatory frameworks to guide organizations in strengthening the security of their critical infrastructure.*

Keywords: *SCADA, industrial operations, real-time data, remote monitoring, IT integration*

Introduction. Supervisory Control and Data Acquisition (SCADA) systems are crucial in controlling industrial processes such as electricity generation, water treatment, and manufacturing. These systems have evolved over time, integrating IT networks and communication protocols for enhanced efficiency and monitoring. However, as these systems are increasingly connected to broader networks, they have become attractive targets for cyber attacks. This article discusses the significance of cybersecurity in SCADA systems, potential threats, and best practices for securing these critical infrastructures.

In the 1960s, when the first computer-based supervisory control and data acquisition systems (SCADA) were being developed, there was no cultural concept of needing to provide any particular protective measures to keep such systems safe from intentional attacks.

SCADA systems monitor and control various industrial operations. These systems provide operators with real-time data, enabling remote monitoring and control of processes that are geographically dispersed. The integration of SCADA with corporate IT systems allows for enhanced data analytics and system management, but it also opens the door for cybersecurity vulnerabilities.

Supervisory control and data acquisition (SCADA) systems are used to monitor and remotely control critical industrial processes, such as gas pipelines, electric power transmission, and potable water distribution/delivery. As such, SCADA systems are important to our daily lives, even though most people never see them or even know of their existence.

To properly understand what SCADA systems are, how they came to be, and why they are designed the way they are, one needs a basic understanding of the history of SCADA system development. It is also helpful to know why things have evolved and what factors have pushed this evolution. Computer-based supervisory control systems were introduced in the 1960s, and the first such systems were based on the mainframe computer technology available at the time.

These systems were not yet called SCADA systems, as that particular acronym did not come into general use until the 1980s. SCADA systems were developed to replace older technologies (e.g., tone telemetry) and to provide features and functions that required computational and logical capabilities. The incorporation of a computer into telemetry systems provided a means for manipulating, processing, storing, and presenting data that could not be provided with previous technologies.

Best Practices for Securing SCADA Systems

To improve SCADA system security, organizations should follow several best practices: